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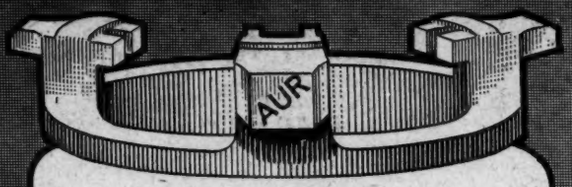

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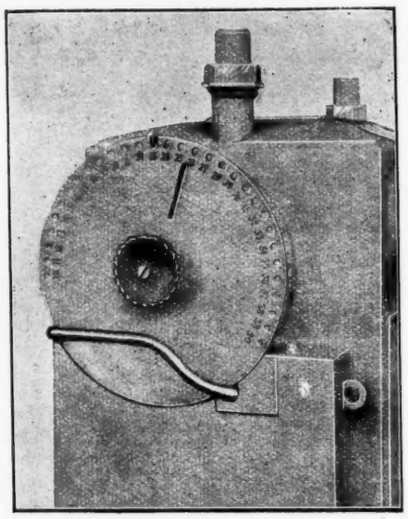

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VOL. CXLIV., No. 2899.] TUESDAY, DECEMBER 3, 1918. [70TH YEAR.

INCREASE IN THE PRICE OF THE "JOURNAL."

THROUGHOUT the four and one-third years of war, we have, despite the ever-increasing printing charges and the extraordinary costs to which paper has soared, maintained the price of the "JOURNAL" and the subscription rates at the old levels, *plus* the extra postage in respect of subscription copies. This has been done at considerable pecuniary sacrifice, in the hope that the end of the war would bring such an amelioration in charges that there would be no necessity to make a change. The hope was falsely based. Although the prospects of permanent peace are excellent, the Master Printers' Association have found it necessary to put another 15 p.ct. upon the extra printing charges, which (being cumulative) now amount to about 40 p.ct. above pre-war figures. In addition to this, paper is at least four times the price that it was preceding the war. The fresh advance of printers' charges cannot be resisted, in view of the fact that wages in the trade have alone increased some 81 p.ct. since the beginning of the war, while the prices of materials and plant of all kinds have, in common with the general trend, advanced enormously.

In the printing and paper trades, as in all other industries and trades, wages and prices of materials and plant are not, it is now abundantly evident, going to recede to pre-war levels. A new and permanent condition has thus arisen which, much to our regret, enforces a revision of the subscription rates and the purchase price of the "JOURNAL." Seeing that we have borne the whole burden of war-time costs, save that of extra postage, it is felt that our subscribers cannot fairly object to the modest addition to the rates which we are now bound to make. From the commencement of the New Year, therefore, the purchase price of the "JOURNAL" will be an extra 2d. (making 8d.), and the subscription rate, payable in advance, will be raised from 21s. per annum, *plus* the extra postage of 2s. 6d., to 28s. inclusive of postage within the United Kingdom, while the credit rate will be advanced from 25s., *plus* the postage, to 32s. inclusive.

In view of the fact that we have hitherto refrained from passing on to subscribers and other readers the extra costs imposed by war conditions, it will be understood with what reluctance and hesitancy the present decision has been arrived at. A technical paper, however, is not a philanthropic institution; and, under the new order of things, commercial principles must be to some extent reinstated.

EDITORIAL NOTES.

Reconstruction of the National Gas Council.

THE meeting on Thursday of representatives of gas undertakings, convened by the National Gas Council, to consider the above matter, was a complete triumph for the promoters. Nothing could have been more gratifying to them than the composition of the meeting, and the goodwill and practical unanimity with which the scheme was received. It was a meeting far different in character from those to which one has become accustomed in the gas industry; and it is a change which everyone will welcome who has the interests of the industry at heart. If an analysis of the representation of those in attendance had been made, we undertake to say that the administrators of the industry would have in numbers shown a preponderance over the officials present. It has always appeared to us that organization in the gas industry commenced at the wrong end for the most effective good to result; and this has been proved to be the case through the inability of any of the existing organizations to speak and act, just in times of the most intense gravity, both promptly and authoritatively for the industry. It is no fault of the gas organizations pre-existing the National Gas Council that they failed in sufficiency at the critical juncture in the history not only of the country, but of the industry. Their constitution being limited, their objects confined, and their power restricted, they could not do the impossible. The right end for organization to have commenced would have been with the gas undertakings themselves. This is a point that cannot be emphasized too much now. The gas undertakings are the backbone of the gas industry. But here we are in the anomalous position that the gas undertakings have not hitherto been organized; and if the present scheme had not been put forward, the gas undertakings, *quâ* undertakings, would have been facing, in a disunited state, a period in which there will be happenings of vital importance to them. We have heard a great deal about what the chemical industry has done in forming a separate organization for dealing with labour matters; but less point has been made of the fact that the chemical manufacturers have united themselves into a strong organization, and invested themselves with powers of, handled thoroughly and discreetly, a very potent character. What the chemical manufacturers have done, the gas manufacturers must do; and the opportunity for this is now given.

We have been told that there is no call for the gas undertakings generally to be organized; also that it is something altogether foreign to them, and that they really do not understand the question of organization nor the need for it. We are not prepared to subscribe to these opinions. The composition of last Thursday's meeting, the whole atmosphere of the meeting, the interest taken in what was put before them, the solid vote given in favour of the scheme, constitute the healthiest form of denial that we have yet come across. Assuming that it were all true. Then we should say that the interests of the industry, the history of the impotence of the existing gas organizations to do all that they might have done had they had at their backs the gas undertakings in organized state to confer power and authority, and to render support in all that was for the promotion of the industry's affairs, as well as the vital issues that have to be dealt with in the immediate future, all combine in calling aloud for the effective unification of the gas undertakings. But the scheme has been adopted; the mandate has been given to go forward with the work of organization. Now it depends upon every individual in the industry who is for progress and protection of interests, and who believes that the conditions of to-day demand co-operation, to do all within his power to make such a success of the organization that no undertaking will care to hold aloof from it. The final words of Mr. D. Milne Watson, in a speech which was notable for the strength of the case he had to present, were an appeal to the gas undertakings to rally to the protection and advancement of the industry. Never has there been a time when such a call was more required; never has there been a time when an immediate response from all quarters of the industry was so much needed.

Right from the opening remarks of Mr. H. E. Jones, the

President, it was clear that the sense of the meeting was favourable to the scheme. This became still more palpable as its architect (Mr. Milne Watson) dealt with its features, and with the preliminary criticism of it that has been made. He left no room for criticism on the ground of incompleteness of the plans for the purpose in view; and one by one down went the props of the criticism that has been levelled against the proposals. No one knows the weaknesses of the old National Gas Council better than the Chairman of its Executive Committee; no one knows better than he what is wanted. He has been through the mill voluntarily and at great personal sacrifice. The lessons he has learnt by experience are embodied in the scheme; and, in its broadly cast lines and comprehensive detail, the meeting could find nothing over which to cavil or raise objection. Points were put forward; but they were only on questions of verbal construction, if perhaps we except the one introduced by Mr. Charles Carpenter, D.Sc., regarding a separate organization to deal with labour matters. But those present found that there was sufficient distinction and protection provided for in the scheme to prevent any committal of the members of the National Gas Council who were not also members of the Employers' Committee to the decisions of the latter. The mover of the amendment in this connection found himself in a state of "splendid isolation" when a vote was taken. On this and other matters, there was complete frankness on the part of Mr. Milne Watson; and no one could have left the meeting with any misconception as to intentions, imperative needs, and hopes regarding the future.

The fundamental defect of the old Council was that it was a nominated body; the new scheme provides for an elected one, and, through the District Boards, for an election which will make representation complete throughout the United Kingdom. We regard the District Boards as fundamentally important; for there is no other machinery that could better ensure representation, voice, and control in all matters that affect general policy. Our only wonder is how those undertakings will stand who decline to unite themselves with the Council; seeing that the decisions of the Council, the conferences with Government Departments, and the issues from them must affect alike the detached as well as the attached elements of the organization. An excellent part of the statement made by Mr. Milne Watson was his defence of the reasons for not venturing, at this critical and exigent time, upon any sort of fusion of the whole of the organizations of the industry. We may make the preliminary submission that, apart from present circumstances, such a complete organization will be easier to establish when the gas undertakings themselves are organized under the scheme; and it is because we are persuaded that the final result will be a more powerful organization than could at the present time be brought together that we could accord it such strong support as we have done without in any way turning our backs on the advocacy of years. Furthermore, how, in view of the immediate demand for work and action on the part of the National Gas Council, would it be at all possible to give birth to an effective scheme for the amalgamation of five bodies of vastly different constitution and objects? To bundle them all into a scheme without thorough consideration, and full discussion of matters which will need some adjustment in order to cause the various elements to synthetize properly, would be to take a false step; and coming events will not brook the delay that would be necessary for the discussion and adjustment.

All along, we have pointed out that what is now proposed is but a long stride to a big end; but there has been a feeling in some quarters that the ambitions for the future have not been made sufficiently plain from official quarters, and that, had they been, it would have stopped a great deal of heartburning and vexation. Well now there can be no further doubt. Mr. Milne Watson, in his speech, showed the utmost sympathy with the Society of British Gas Industries; and made it plain that there is no intention of losing touch with the Society even for an interval. A Joint Standing Committee is to be formed, upon which will be represented the Society of British Gas Industries, the Sulphate of Ammonia Association, and probably other bodies dealing with the business side of the industriy. But matters are not going to rest there. One of the first duties of the new Council will be to appoint a Committee, consisting of representatives of the five bodies, to consider and report as to whether some scheme cannot be devised for unifying the whole of the different organizations. This is a business-like and democratic way of dealing with the question; and, in our judgment, it will give much satisfaction to the members of the Society, as it shows that it is not proposed that their organization shall be left derelict. There were several members of the Society at the meeting; and we think, in view of Mr. Milne Watson's pronouncement as to intentions, that they took a very dignified course in not discussing the matter, but tacitly accepting the proposed Committee as an earnest of a desire to realize a complete form of organization, of which the Society itself shall be one indivisible part.

With regard to Mr. Carpenter's point as to the Committee of Employers being a "separate organization," we need not add much to the incidental reference to it earlier in this article. It will be remembered that Mr. Carpenter was the author of the addendum to the resolution concerning the reconstitution of the National Gas Council which was passed by the Institution of Gas Engineers on Oct. 15. As was submitted in the comment made in our issue for Oct. 22, it was obvious that the Council of the Institution either did not appreciate the import of the addendum, or else they were under the impression that the proposed Committee of Employers would meet Mr. Carpenter's idea of a "separate "organization." We suggested to the Council at the time that they must construe the proviso in the light of the speech made on the occasion by its author. That we were right and the Council wrong is clear from the statement made by Mr. Carpenter on Thursday. The Council of the Institution will no doubt note his remark that "it will perhaps save "some difficulty in the future if this matter is dealt with "now rather than postpone it." What does Mr. Carpenter mean by "some difficulty in the future"?

However this is a comparatively small matter. The main thing is that the reconstitution of the National Gas Council, which means the organization of gas undertakings, company and municipal, has been agreed upon; and no time must now be lost in setting to work—first by forming the District Boards, and getting their machinery into operation, and then by the District Boards and the other organizations concerned appointing their representatives for the Central Executive Board. The problems and tasks confronting call for heart and soul activity and solidarity. The industry wants no more apathy. It has been tried, and proved a dead-failure in everything save in retarding the progress of the industry and the defence of its interests.

Gas Bills for the Coming Session.

THE prospects in the gas line of legislative work are not good for the first session of the new Parliament. The managements of gas undertakings have probably been too much engaged wrestling with the load of war-imposed burdens to think of parliamentary schemes, and so have deferred them to a more convenient time. The signing of the armistice with Germany has also coincided with the period in which the preliminaries associated with Private Bill promotions should have been attended to, according to parliamentary rule. But for those who would like to get additional powers in a session in which Parliament, steeped in reconstruction and progressive industrial ideals, will, it may be expected, look with indulgent eye upon what is submitted to them by enterprising promoters, there is hope, though late in complying with the terms of the Standing Orders. Our "Par-"liamentary Intelligence" of last week announced that the Chairman of Committees of the House of Lords had stated that he was prepared to give favourable consideration to the introduction on this occasion of late Private Bills, more particularly those which are calculated to promote work; and he indicated also that the Chairman of Ways and Means anticipates that the House of Commons will relax their Standing Orders, with the view to enable further promotions to be made. Though in ordinary sessions, rules must be complied with, it is good to see the Private Bill Authorities taking such a practical view of what is desirable in such extraordinary times as these. Whether their benevolence will have any good effect, cannot at present be said. But the number of notices of Bills shows a decided unpreparedness on the part of statutory concerns to enter upon the promotion of new measures. Besides in the gas industry there exists an amount of uncertainty as to the prospects regarding gas manufacture and the quality of gas. New ideas as to economy, efficiency, and use have been generated by war experiences; and practical form has to be given to these. More information is desirable; and yet the gas industry wants to conserve for itself and the country, the teachings and achievements of the war years. Up to the present there

is only notification of thirteen Bills and a couple of Orders which deal with gas; and the outline of the powers to be sought does not mark the promotions with either unusual importance or novelty. There are financial proposals, extensions of limits, and the Huddersfield Corporation and the Sunderland Gas Company are contemplating the absorption of neighbouring concerns. The Huddersfield Corporation have their eyes on the Longwood and Slaithwaite Gas Company and the Kirkheaton Company; and the Sunderland Company are intending to annex the Whitburn and South Hylton Companies. Consolidation and concentration are in keeping with the views of departmental investigation into electricity supply, and with precedent doings in the gas industry. The Bournemouth Gas and Water Company, probably with an eye to future business, are desirous of being permitted to contribute to the costs of schemes of town planning; and they want to vary the provisions relating to dividends and charges for gas. Here and there calorific power, annual meetings, and electricity supply authorization are mentioned. Residuals powers are desired by the Hartlepool Company and the Stockton-on-Tees Corporation. The Newark Company are desirous of supplying power gas; while the Hartlepool Company, the Huddersfield Corporation, the Pembroke Company, the Stocksbridge Company, and the Sunderland Company are seeking authorization to purchase gas in bulk from outside sources. Most of these are now quite ordinary powers; but they point to certain aspects of modern development in gas supply.

The Industry's New Technical Progress.

DURING the war, the technical outlook of the gas industry has undergone a change of unprecedented character. There is something revolutionary about it all; but it is revolution not of destructive, but of constructive order. New processes have been introduced that have brought in their train new problems, and fresh claims to greater legislative latitude. The outstanding features have been the steaming of retorts of all types—continuous and intermittent verticals, and inclined and horizontal retorts—the use of blue water gas, or very lightly carburetted water gas for dilution purposes; and the washing of gas for benzol extraction. The two former processes have proved their coal-economizing power, and therefore the production of greater economy for the gas industry and its customers. The benzol-extracting process has shown an ability to assist the country without any appreciable detriment to gas consumers, though latterly it has been learned that, if the gas is stripped, there is trouble with the meters, and that with blue water gas the sulphur dioxide, if it arrives at the meters, will damage both the metal parts and the leathers. But for the latter, as Mr. J. G. Taplay has recently told us, the remedy is the simple one of using a little oil for carburetting purposes or the passing of a small amount of ammonia with the blue water gas into the purifiers. The use of a little carburetting oil, or the paraffin-spraying of gas-meters (a further interesting article upon which subject by Mr. B. R. Parkinson is published in to-day's issue), is also a correction for any corrosive action due, since the removal of benzol from the gas, to the more energetic interaction of carbon bisulphide with ammonia. When a remedy so simple, and normally so comparatively inexpensive, can be applied, there is no excuse for not taking full advantage of the new economies which war-time practices have disclosed. Gas-works able to steam their charges have set new standards of production, which make the working standards of those gas undertakings that are not steaming, or cannot do so, appear very much out of the running. We know of various large concerns that have not yet begun to take advantage of steaming as an economy-producer, which are closely investigating the published details and the actual working. There is no question now that we are well over the threshold to new manufacturing conditions in the industry, if the position is only handled correctly.

The vertical retort has been a valuable pioneer in the gas industry. It has had a marvellous educative effect in pointing the way to obtaining improved results from horizontal retorts. The full or practically full charges in them showed that reduction of the amount of high temperature surface helped to eliminate the degradation of the hydrocarbon constituents of the gas; the result being more gas per ton, and yet of equal, if not superior, quality. The lesson was not lost upon the users of horizontal retorts; and greater weight charges put into horizontals—minimizing the area of highly heated surface against which the evolved gases came in contact—showed results in make and quality of gas closely approaching those from the verticals. The success in economy and efficiency that was then realized was but the introduction to a natural sequence of progress. The fuller charge protected the hydrocarbons; and then it was found that steaming the charges not only produces water gas for mixing with the coal gas (but, as Prof. Cobb in his William Young Memorial Lecture showed) the diffusive properties of the hydrogen and the pressure of steam introduction accelerate the passage of the gases, release additional volatile matter from the interstices of the coke, and help further to shield the hydrocarbons against undue disintegration and destruction. As Prof. Cobb describes it, a new atmosphere is created inside the retort, which has very material advantages. This is the only explanation of the fact that gas volume is so considerably increased without sensibly depreciating the quality. What is being done by steaming the charges in continuous and intermittent verticals is, in different manner, being applied to inclined and horizontal retorts, raising the level of productive result, though in modified degree. The productive results have been freely spread before the gas industry—not from one quarter only, but from several, and in form which admits of no dispute. The facts are of concrete order, and in the main confirmatory as between one works and another. There is one ground for caution. The results in gas are good, and the returns in respect of bye-products are likewise. It would therefore be a great pity to go along too fast to higher makes, and spoil the case. There are excellent reports as to makes between (say) 16,000 and 20,000 c.ft. per ton; and the progress is sufficient for the present (except experimentally for information), in view of the uncertainties that are engendered by going to what must, at any rate for the time being, be called excesses. There can be over-steaming, with resulting difficulty, and depreciation of results. What is wanted is a condition of working that can be constantly maintained with a day-by-day reproduction of results.

Knowledge as to carbonizing practice, which has raised results beyond the most sanguine expectations of former days, has been added at such rapid rate the last few years, that it has only accentuated the massive character of the ignorance that existed in this direction before the year 1914. As Mr. Norton H. Humphrys remarks in an article that is published this week, the ignorance of that time is now so glaring that "the importance of energetic steps to a more "satisfactory position takes prominence before anything "else." The truth of this statement should impress and activate every professional man in the industry. What is happening is that the working experience of the industry and the proved results have outstripped the investigations of the Fuel Research Board, whose actual testing work is not expected to commence before the New Year, and whose conclusions and recommendations cannot be published till extended research is made under many different circumstances. Therefore there will be very considerable loss of time if the industry is to be debarred from making full use of its new knowledge pending the issue of a report and recommendations by the Board. When we compare carbonizing knowledge to-day with the ignorance existing only a short space before the war, the uneconomy and the solid waste of money that existed then are at once obvious without attempting to attach to them any exact money value. The same applies to the washing for benzol. There were exaggerated notions in bygone days as to the disastrous effects of the stripping, or the partial stripping, of the gas of benzol. Where have these effects been during the war? There has been no special trouble with consumers; no increase of complaints. Some towns actually report a reduction of complaints. It may be necessary to increase the scrubber plant for ammonia recovery in consequence of part of the plant being set aside for benzol extraction; but this will pay. We have asked before, and we ask again, is the gas industry to forfeit all this experience, economy, and higher efficiency for the sake of a few B.Th.U. per cubic foot of gas? Is progress to give way to calorific value; or is a small recession in calorific value to be made to permit of the progress of economy which will be in the national interests through extended industrial and domestic service? It is a case where representation should be made to the Board of Trade and the Ministry of Reconstruction, so that the benefits of the progress during the war may not be annulled, or be left to wait unattended to and unutilized on the doorstep of the Fuel Research Board, and a period of higher service

from the gas industry be lost. There is ample evidence with which to oppose obscurants and procrastinators. In this matter they are the enemies of the industry and of the consumers. The industry should be allowed to pursue its work on the now proved lines, and not be compelled to take retrogressive paths to the *status quo ante bellum*. This would be altogether opposed to the new spirit that is abroad, and which is found in the establishment of the Committee of the Privy Council for Scientific and Industrial Research and in the work of the Ministry of Reconstruction.

A Gradual Release of Materials.

GOVERNMENT control and the establishment of such objectionable, though necessary, things as priority permits came upon the country gradually, and reached their peak point in the latter months of the war. Only by the same gradual process shall we see the end of control and permits. But a beginning has been made with the dethronement of these imperious masters, and the initiation of relaxation. This is essential, in view of the fact that employment has to be found for the men returning from the front, and for the men and women who are filtering back from munitions to peace work. Peace work cannot be done without materials; and, given materials and labour, there is a considerable amount of work close at hand. The Ministry of Munitions have recently been making inquiry of the electricity undertakings as to the work that they consider is immediately necessary; and in the gas industry there is a large amount of work waiting to be taken up (but no similar inquiry has yet been made of gas undertakings) to compensate for delays of new work and enforced postponement of repairs and renewals. Ministers are speaking about this subject of the industries providing employment; the gas industry, among others, will be not only willing, but glad, to do its part, providing the materials and labour are available. Dr. Addison, the Minister of Reconstruction, gives hope of the beginning of a better state of things; and he does this on the advice of the Standing Council on Post-War Priority. He desires to make it known that the position as to the supply of materials to manufacturers is such that control can now be greatly relaxed, and the producing capacity of the country can be gradually released for peace production. Everybody will be glad to hear this—not least gas engineers who have been watching with considerable anxiety their hard-pressed plant which shows signs of fatigue and impairment. Release of materials and restoration of manufacturing plant are needful to realize the maximum employment and output. Hence the announcement that Dr. Addison makes; hence, too, the short list of important purposes for which released material will be granted in priority to other uses. Coming first in the list is the maintenance, repair, and replacement of existing machinery and plant in the United Kingdom; and transport on sea and land makes a good second. Other purposes follow; but it is in the foregoing that the gas industry will have most interest. Control will have to be continued, but not on such stringent lines; and procedure is under examination with a view to simplification. For the present, applications for priority permits should be made to the same departments as hitherto. But, of course, the first thing will be for those manufacturers who have been engaged upon war work, to be smart in getting their plant and men reorganized for normal work. The thing is to make a move quickly, because no doubt the applications for priority permits for materials will be dealt with in the order in which they are received.

Gas-Coal Deliveries—Serious Instructions.

If the "Iron and Coal Trades Review" is rightly informed the Coal Controller has issued instructions to collieries in regard to the order of precedence of deliveries which have a very serious meaning for gas undertakings. The order of precedence is: (1) Admiralty—also shipment to Allies and British Possessions; (2) War Office requirements; (3) railways; (4) bunkers; (5) shipment to neutrals; (6) household supplies and agricultural requirements; (7) gas and electricity works supplies. Thus gas and electricity works are placed at the bottom of the list. In its comments, the "Review" says: "In order to carry out these instructions, the collieries whose outputs are utilized for house and gas coal will of necessity be compelled to very largely reduce the tonnages to gas-works, where in many cases reserve stocks are already far too low in view of further interrupted deliveries. Clearly, if house coal is to have preference, gas-works will be short, and *vice versâ*. This reduction in supplies for gas-works will have serious results—a fact which is fully realized at the collieries concerned. The question of supplies to electricity works will not be so much affected, as for the most part they use small fuel that is not suitable for household purposes." What of the Coal Controller's recently personally made promise that his efforts would be directed to putting into stock at gas-works a distance from sources of supply the equivalent of six weeks' needs, and at gas-works nearer the coal-fields, four weeks' stock? The methods adopted for rewarding the gas industry for its work in connection with the war pass understanding.

Gas Officials and News Reports.

In our news columns to-day, a correction is published regarding the paragraph which appeared last week as to the settlement of the strike of the Bournemouth gas workers. This gives us an opportunity of saying that gas officials are themselves partly to blame for any inaccuracies that may appear in news items. It must be remembered that news correspondents communicate to us intelligence from all parts of the United Kingdom, which arrive day by day right up to the time of going to press. If gas officials forwarded the information, we should naturally adopt—if not the complete report—the facts submitted, or see that the news correspondent's notes conformed in the main particulars. If this is not done by gas officials, and they leave to chance the transmission of news from other recognized sources, and any inaccuracy results, they must take upon themselves some share of the blame.

Wages Legislation.

It is positively certain that wages will not again return to their pre-war levels, notwithstanding that the cost of living may descend with measured, though not hasty, steps, if the profiteers can help it, or the Government are indifferent to the defence of the people against exorbitant charges. Labour will resent these; but simultaneously it will show its profound respect for logic by resisting a *pari passu* retracing of the course that wages have taken. Resistance will be the more forcible from the munition workers whom the Government will be dumping upon the labour market, and who will not approve of an inflated income being brought down to a reasonable sum. The wages question is going to be a sore point; and the fact will take a lot of effacing that the namby-pamby way in which the wages question has been handled by the Government Departments throughout the war period will be responsible for the aftermath of grievance that there will be from the sides of both employers and employees. Looking forward, the Ministry of Labour have tried to mitigate matters by postponing the day when wages may drop fairly heavily. They have had passed through Parliament, the Wages (Temporary Regulation) Act, the main purpose of which is to secure the maintenance for a period of six months of the minimum wages generally applicable at the date of the signing of the armistice in each trade, or branch of trade or district, to each class of workmen, except in so far as the minimum wages are varied by arbitration, agreement, or settlement approved by the Minister of Labour. Then a Court of Arbitration to deal with differences is also to be established. Of course, minimum rates of wages being provided for, the Act leaves all questions as to wages open to free negotiation; so that trouble is not altogether avoided. But it is hoped by the Minister of Labour—we fear it is a vain hope—that this freedom to negotiate will be exercised in a conciliatory spirit, "so that satisfactory wage arrangements of a permanent character may be established in each trade before the Act expires."

"Early Door" Demobilization.

In making applications for the release of officers and men from the forces, it is necessary that particular care should be taken to confine want to really super-men. The fact of the matter is, the authorities are being inundated with applications, while the men who can for the present be released are of limited number. Naturally, every employer wants to get his business affairs reorganized and resettled as early as possible. It must, however, be that the release of officers, men of special attainments or skill, and pivotal men, shall be dealt with systematically. But this requires more application for forms, more filling-up, and more waiting. The form trouble seems to be an interminable one; but

in this connection there must perforce be routine. With the concurrence of the other Government Departments, the Ministry of Labour have organized the requisite machinery for dealing with "early door" demobilization. As pointed out last week, when general demobilization starts, priority of release will be given to officers and men who have definite employment waiting for them. For putting the machinery in motion for securing the release of an officer with definite employment awaiting him, "Form R.C.V." should be obtained from the Local District Director, Appointments Department, Ministry of Labour. University, scientific, or technical institutions expecting the return of a valued officer should procure "Form R.C.T.V." For men other than commissioned officers, employers must obtain from the Local Exchange the specially printed post-card "E.D. 406." On the other hand, all officers and men will be provided with a Civil Employment Form, on which they may state if an employer has promised them work. But no information can be given as to when individual officers and men will be released. It is clear between application and release there will be a decent interval. Arrangements are being made for the release, in advance of the general demobilization, of pivotal men—men whose release will be of immediate national importance. A list has been prepared of industries, businesses, and professions which are entitled to a priority share in the limited "pool" of men who will first be released. The gas industry, coking, and electrical industries are not to be found in the list; but "engineers" are classed among the professions. However, an employer whose business is not covered by the list, but who thinks he is justified in asking for exceptional treatment, for an officer or a man must fill in "Form D.F.2," which can be obtained from the Ministry of Labour Demobilization and Resettlement Department, No. 8, Richmond Terrace, S.W. In applying for this form, care should be taken to state the nature of the business, the capacity in which it is proposed to employ the man, and rank and rating in the forces.

A Poor Exhibition.

We cannot congratulate the Coal Controller's Department on the Fuel Economy Exhibition in Trafalgar Square. It is anything but worthy a Government Department. It might be a sort of side show at a fair; but good showmen would have arranged something better for the inspection of the public. We are afraid it will not do much to help to economize the use of coal. There are one or two decent exhibits, but for the most part they will be useless for the purpose destined. The exhibition will never be seen by, nor will it instruct, the millions. There are some fittings for making existing coal grates more economical; there is an arrangement for obtaining upstairs hot water from the washing copper downstairs; there are fire-bricks, and cements for filling cracks in the bricks; there is dust-bin refuse, from which cinders should be picked; there are a couple of displays of messy stuff from which briquettes can be made at home, and demonstrators are showing how to do it. We should like to see the Coal Controller personally utilizing these systems. Gas is not actually taking part in the display. But one lady has a poor little gas boiling-ring over which she sets a biscuit box, ventilated at the top of the sides, and in which she has cooked her modest joints economically and well (so she says) for the past two years. The crude contrivance raised a smile. A trivet for gas or coal fires is also shown. But the whole thing was disappointing; so we will not say more about it.

Coal and Coke Exports.

The shipments of coal, coke, and patent fuel in October show closer approximation to the total tonnage for the corresponding month of last year than for the same period of 1916. The exports last month aggregated 3,130,621 tons, which was a reduction on October last year of 50,291 tons, as against a reduction compared with October, 1916, of 577,679 tons. The value last month was high. Totalling to £5,348,595, this was an increase of £885,567 on October, 1917, and of £472,862 on the same month of 1916. The average value per ton last month was about £1 14s. 2d., or nearly 1s. 2d. more than for October of last year. For the ten months ending October, shipments were: 1916, 35,151,172 tons; 1917, 32,619,757 tons; 1918, 29,331,605 tons. The values for the ten months were: 1916, £42,886,720; 1917, £43,948,383; and 1918, £44,309,576.

PERSONAL.

Mr. ALEXANDER WRIGHT, who has just been appointed Gas Manager at Oban, was before that Manager of the Lockerbie Gas-Works.

The Knaresborough Urban District Council have engaged Mr. FRANK H. ROBINSON, Assoc.M.Inst.C.E., of Harrogate, to inspect and report on the gas-works.

Mr. ROBERT HAMILTON, the Manager of the Prestonpans and District Gas Light Company, was last Saturday week, at a meeting of the Directors of the Dalkeith Gas Light Company, unanimously appointed Manager, in succession to Mr. Robert Wolfe Cowie, who is leaving for a similar appointment at Port Glasgow. Mr. Hamilton was formerly Gas Manager at Lochwinnoch (Renfrewshire), and also had previous experience as Assistant Manager at Torquay and Berwick-on-Tweed.

After about thirty years' service, Mr. R. J. LUKEY, the Secretary of the Australian Gaslight Company, of Sydney, is, as already stated in our columns, retiring. He was granted extended leave of absence in August last, and will cease his connection with the Company on May 1 next year. Prior to entering on his leave, Mr. Lukey received gratifying evidence of the esteem in which he is held by those with whom he has for so many years been associated—a gold inscribed watch as a personal gift from the Directors. In making the presentation, the Chairman (Mr. G. J. Cohen) voiced the appreciation of the shareholders and the Board of the long and honourable service given by Mr. Lukey to the Company. He was also entertained at a dinner and theatre party by the senior members of the staff; the chair on this occasion being taken by Mr. Andrew Wilson (the Engineer), who expressed the hope that Mr. Lukey would enjoy his well-deserved holiday. Mr. C. U. B. GURNETT (the Assistant Secretary) will officiate as Acting Secretary during Mr. Lukey's absence.

The relations between the Birmingham Gas Department and the Birmingham Master Gas-Fitters' Association are of a very cordial character. There is complete trade co-operation; and during the past ten years £100,000 has been paid to the members of the Association for work done. The relations were at one time strained; but an improved feeling was gradually brought, thanks largely to the tactful offices of Mr. S. R. BARRETT, until recently Superintendent of the Fittings Department of the Corporation. At a well-attended meeting of the Association on the 21st ult., Mr. Barrett was a recipient from the members of a set of wine and liquor decanters. It was subscribed as a token of esteem and appreciation of his long and valuable services. Mr. Breeden (the President) made the presentation, and spoke of the cordial relations existing between the Corporation Gas Department and the Association—a happy state of affairs which was due in very large measure to the untiring efforts of Mr. Barrett, whose chief aim during the whole of his thirty years' service with the Gas Department had been, not only to raise the standard of the gas-fitters and the gas-fitting trade, but to bring together in closer union the members of the outside trade and the Gas Department. Mr. Barrett, in reply, said it was gratifying to him to know that the ideals of co-operation which for so many years he had kept to the forefront had had the effect of bringing about such a unity of feeling between the master gas-fitters and the Gas Department. Mr. A. W. Smith (Secretary to the Birmingham Gas Department) said he was very sorry that Sir Hallewell Rogers was unable to be with them that evening; but the department had already paid tribute to the good services of Mr. Barrett. Mr. R. J. Rogers (the Fittings Superintendent to the Gas Department) urged upon the members the necessity of the gas-fitters' assistants' education, and of the education of those members of the Forces who for the last four-and-a-half years had been away from their trade.

OBITUARY.

Mr. EDWIN H. STRINGER, J.P., who died at Wolverhampton last Sunday week, aged 83, was for over fifty years the head of Messrs. Stringer Bros., of West Bromwich. He formerly represented Edgbaston in the Birmingham City Council, and served on the Gas and other Committees. In 1885 he was placed on the Commission of the Peace for Warwickshire; seven years later his name was added to the Commission for Birmingham and Worcestershire; and in 1896 he qualified as a Justice of the Peace for Staffordshire. On retiring from business, Mr. Stringer went to reside at Wolverhampton.

Influenza, which developed into pneumonia, caused the death, in Media (Pa.), of Mr. ROBERT FFRENCH PIERCE, Chief Illuminating Engineer of the Welsbach Company of the United States, and a member of various scientific societies. He was the author of numerous papers on the subject of illumination by both gas and electricity; and the reproduction from time to time of his writings in the pages of the "JOURNAL" has rendered his name familiar to readers. Mr. Pierce, who was only 39 years of age, was a graduate of Harvard University, and became associated with the Welsbach Company some seven years ago.

We much regret to learn from a recent number of "Het Gas" of the death, on Oct. 17 last, at Haarlem, of Heer N. W. VAN DOESBURGH, an honorary member and past-secretary of the Dutch Association of Gas Engineers, and former Manager of the Leyden Gas-Works. Heer Van Doesburgh was born at Zaandam in 1855,

and, after education at the Polytechnic School at Delft, held various appointments at home and abroad until, in the year 1891, he became Assistant Manager at the Hague Gas-Works. He was appointed Manager at Leyden in 1898, from which position he retired in 1916. During his tenure of management the output of the Leyden Gas-Works doubled, while the electricity works, which were also under his charge, had developed enormously. As a very active member, and for many years Secretary of the Dutch Gas Association, Heer van Doesburgh was well known to many English gas men, who will join with their Dutch colleagues in greatly deploring the loss they have sustained by his death.

MASONIC.

At last Wednesday's meeting of the "Evening Star Lodge, No. 1719," the election of Worshipful Master for the ensuing year—in succession to W. Bro. Fred. J. West—resulted in the appointment of W. Bro. H. W. Packham, S.W. of the lodge. W. Bro. Walter T. Dunn, P.M., is temporarily vacating the position of Secretary, which he has held for many years past, and was elected Treasurer for 1919, in place of W. Bro. F. W. Cross, who has filled the position for the last two years.

The regular meeting of the "Northern Star Lodge, No. 3053," was held at the Midland Hotel, Manchester, on Friday last, when W. Bro. Joseph Taylor, of Bolton, was elected to succeed W. Bro. J. W. Morrison as Master. The Treasurer (W. Bro. W. Whatmough) was re-elected, as was W. Bro. Fred J. West as Charity Representative. A collection made on behalf of the Prisoners of War Fund realized the sum of twenty guineas. The proceedings were in a measure overshadowed through the recent deaths of one of the members—Bro. Thomas H. Duxbury, of South Shields—and the Deputy Provincial Grand Master of East Lancashire.

The issue of the "Freemason" for the 23rd ult. gives particulars of an interesting event in the life of the "Lodge of Integrity, No. 163"—the completion by Bro. John E. Williams, of Manchester, of fifty years' membership of the lodge. The event was specially celebrated at the meeting of the lodge in September, when the evening was made a Past Master's Night. After the confirmation of the minutes of the previous lodge meeting, the various officers vacated their offices for the rest of the evening, and each office was assumed by a Past Master of the Lodge; and, in special honour of the occasion, Bro. Williams occupied the chair. It was resolved: "That, in order to celebrate the Masonic Jubilee of W. Bro. John E. Williams, P.Prov.G.W., the sum of £50 be paid out of the lodge charity fund to one of the masonic charities, for the purpose of endowing a lodge chair—such chair and charity to be selected by Bro. Williams, and associated in suitable form with his Masonic Jubilee." Subsequently the W.M., on behalf of the members, heartily and sincerely congratulated W. Bro. Williams upon his having in January last completed fifty years' unbroken membership of the lodge; and, to show the affection the brethren bore towards him, he asked Bro. Williams's acceptance of a silver-plated tray, entrée dish, and pair of sauce boats as a memento of the occasion, and wished him and Mrs. Williams many more happy days. Our contemporary reports that W. Bro. Williams was initiated in the lodge in February, 1868, by his father, who was then W.M. After serving in the junior offices, Bro. Williams was elected Master in 1880. In 1894, he was appointed D.G.D.C. of East Lancs., and last April (in honour of his Masonic Jubilee) was promoted to P.Prov.J.G.W.

ELECTRICITY SUPPLY MEMORANDA.

WE have great admiration for Mr. H. Rider Haggard—novelist—and his book on "Rural England" shows a sound practical acquaintance with the necessities for the development of the land.

Mr. Rider Haggard and Rural Electricity Supply.

When he wrote this book, he informs the world, through a letter in "The Times," he had not in mind the infinite possibilities of electricity. But a speech made by the Prime Minister has put the subject into his head; and so he proceeds to get out of his depth, and drops once more into fiction. He agrees with the desirability of this development. Putting aside the other uses which could be made of the power, what would it not mean to the countryside, he asks, if every village and every cottage were lit, and to a great extent warmed, by electricity, with which, too, most of the cooking could be done? What indeed! The question shows that Mr. Rider Haggard has no clear conception of what it all means from the economic standpoint. Let us take him back to electricity generation. At the present time, including large and small generating plants, the average consumption of coal per unit of electricity produced is estimated variously at from 3½ to 5½ lbs. The lower figure (taking coal of a calorific value of 13,500 B.Th.U. per lb.) represents an expenditure of 47,250 B.Th.U., the higher figure 74,250 B.Th.U., per unit of electricity generated; and the unit of electricity is only capable of developing 3420 B.Th.U.! Between these figures (which only represent respectively about 7 and 4·6 p.ct. efficiency), Mr. Rider Haggard will see, there lies great waste of thermal energy. Supposing a reformed generating system in years far ahead can generate at 2½ lbs. per unit, this will mean an expenditure of 33,750 B.Th.U. to obtain 3420 B.Th.U., or still only 10 p.ct. efficiency. And this does not take into account the heavy losses in transmission; so that the expenditure of coal in generating would be increased per unit delivered at the consumers' terminals. Then there is considerable doubt as to the cost of transmission from super-stations, and as to the supply and cost of the materials for the cables, as well as the cost of upkeep to maintain their integrity, as near as possible, for the conveyance of current. Again, the load in rural areas would not be the most promising for cheap supply. Mr. Rider Haggard should calculate the cost and consumption of B.Th.U. as electrically provided for lighting, warming, and cookng; and ascertain whether the rural cottager's purse will be deep enough to stand the strain. We think not. He is further of opinion that, with all our water power, energy could be generated quite cheaply. It would be interesting if he would state where there is suitable water power in this country for generating electricity on the large scale. Truth is sometimes stranger than fiction. The studies of our eminent novelist might be extended to the use that gas-works make of coal. Variously from 12,500 c.ft. to (in latter-day processes) 20,000 c.ft. of gas are being produced per ton of coal—the lower production representing 6,250,000 B.Th.U.; the higher, 10,000,000 B.Th.U. Coke to the extent of 9 to 10 cwt. is also yielded for sale. Benzol and toluol for high explosives, dyes, or motor car use, tar, liquid fuel, pitch, and a host of other derivatives, sulphur for sulphuric acid making, and (this should appeal to Mr. Rider Haggard) sulphate of ammonia for the land, are contributed to the country's economic well-being. All this should appeal to his great imagination; and he should set to work to cultivate greater relationships between rural areas and gas supply.

The Problem of Distribution.

The question of the distribution of electricity from super-stations was dealt with by Mr. Alan A. Campbell Swinton, F.R.S., in his recent address to the Royal Society of Arts. It may be assumed that Mr. Campbell Swinton has much closer knowledge of this subject than Mr. Rider Haggard. Government Committees constituted of men with certain interests may recommend, the Government may propose, Mr. Lloyd George may bless, but Mr. Campbell Swinton warns people against being over-sanguine. On what grounds? Certain of the most experienced experts are of opinion that the limits of economical generation and distribution are already being reached in the case of some of our existing larger systems. The question of material for distribution conductors is also a serious one, particularly in view of the fact that the amount of copper in the world is limited. There are also limits to the endurance of insulating materials obtainable at reasonable cost. Of course, one does not know what improvements may be effected; but we have to deal with the existing state of things, and this existing state does not give much promise to the great expectations that have been formed in some electrical quarters, swallowed by political men, and now grasped by one of our eminent writers of fiction. We certainly are making progress—if not of a very material order.

Labour Finds Electricity a Handy Weapon.

Electrical labour has it within its power to deal very unceremoniously with any who oppose its desires or those of any of its allies, and some of its allies appear to be those who entertain extreme socialistic views. It showed its talons and issued threats in connection with the wish to have the Albert Hall for a meeting last Saturday week. There had been other labour meetings there; and some of the speeches were of a distinctly revolutionary and disloyal order. The Council of the Albert Hall, therefore, decided not to again let the building for this purpose. But the Council had not reckoned upon men, who are such vehement champions of the freedom of speech, being no respecters of the freedom of private rights and decisions on the part of others. So in stepped the Electrical Trades Union, and demonstrated how easy it is for its members to do no end of mischief through the ease with which they can deprive a public building of the means of lighting; for the Council of the Albert Hall, though a place in which large numbers of people assemble, have not an effective modern system of alternative gas lighting there, but only old gas-jets round the dome, and other gas-lights dotted about here and there. In the name of freedom of speech, but not in that of the freedom of other people's rights, the electricians disconnected the supply of current; thereby hoping to render the hall useless for other fixtures, until the ban was removed from the holding of the labour meeting. This was, of course, an illegal act; but from the labour standpoint it proved to be effective, for the Government intervened, and suggested to the Council that the hall should be reserved for the labour conference next Saturday. This is now described by labour representatives as a "concession to fear." Threats went beyond action. Had the concession not been made, the Electrical Trades Union had resolved to call out the men at the Kensington and Knightsbridge Electric Supply Company's station; and then, if this was not sufficient, the whole of the electrical men on the underground railway system in London, it was said, would probably cease work. Labour's ways can be autocratic on occasion; but labour itself strongly resents the application of autocratic methods against itself. The chief point, however, is that electricity has shown itself

a useful instrument in the hands of labour for reprisal purposes, or for the enforcing of its demands.

The Cooker Tests—Electrical Chagrin.

The electrical people are very sore over the comparative tests between gas and electric cookers which a courageous maker of electric cookers arranged with the British Commercial Gas Association to carry-out in order to test the veracity or otherwise of the claims he had made for electric cooking. The results were published in the "Memoranda" last week, and they do not please electrical folk. If they had extended beyond the oven, they would have been more disastrous still for electricity; and we would suggest that, if further tests are arranged, they should be made to cover all cooking operations, and not stop at the oven. The electrical maker has not done himself the good he had hoped for in taking part in the tests. All sorts of excuses are now being made. According to the "Electrical Times," there appears to be some diabolical plan at the back of the minds of the "B.C.G.A." to land electrical engineers in a difficult position; but "the latter have been wise enough to see where the danger lay, and have avoided becoming parties to any test that, on the lines laid down by the gas people, could neither be impartial nor convincing." From this it would appear that the electrical engineers know well that it would not be a troublesome matter to land them in difficulty in this respect. Really we cannot see why the electrical people should not submit to the "B.C.G.A." lines of their own which could be accepted for a comparative test. But they must not expect to have things in an open competition all their own way. The electrical manufacturer who indulged in the competition is chided for allowing his enthusiasm to carry him away, and to have agreed to compete in a test in which he was hopelessly outclassed from the first. Why outclassed? Electric cooking is no new thing; and the electric oven used in the tests, it is admitted, is a new design, but an "untried" one. Being a new design, it should incorporate all that former experience has shown to be good. The operator of the electric oven is said to have been an amateur, while the gas-oven was in the hands of an expert cook. As a matter of fact, the umpire was a member of the staff of the National Training School of Cookery, where electric-ovens are no strangers. Our comtemporary says it could name half-a-dozen different types of electric-oven any one of which in the hands of an experienced demonstrator, would have made an excellent showing, and proved beyond any doubt that the claims of economy and avoidance of waste with electric cooking are well founded. "The competence of the cooks to use an electric-oven" is also a point made in reference to the matter by "Electrical Industries." We have been grossly misled by "experts" in electric cooking. One of their claims is that electric cooking is all so simple that the work is practically automatic. Upon what grounds does the "Electrical Times" allege that the gas interests have no intention of taking part in another test in which an electric cooker of established reputation would be operated by a trained cook? Often there have been challenges from the gas side which have never been accepted; the makers probably knowing that recognized electric cookers have already been subject to pretty extensive tests in the testing rooms of gas undertakings, so that their capacity is well known. Now our contemporary asks, Is there any maker whose electric cookers have proved their claims in actual practice who will take up the cudgels on behalf of the electrical industry, and challenge the gas interests to a test? To the question there is the addendum "on the understanding that the result would be accepted as final by both parties." This is unnecessary. Finality has not been reached in gas-oven improvement. Immediately after the war there may be new gas-cookers on the market; and with the more economically produced heating gas which is coming along, new conditions will arise which will affect the cost of operation. But to the question without the addendum, we await the answer from the makers of electric cookers. [Since this paragraph was written, Mr. C. R. Belling has sent a letter to the "Electrical Times" which we reproduce to-day in our "Miscellaneous News" columns.]

Plant Extensions During the War.

There has been a great outcry during the war period as to the difficulty of securing electricity plant; but anyway, according to a statement issued by the Ministry of Munitions, some 76 undertakings have not done at all badly in new installations. There are 327 municipal and 230 company undertakings operating. Of the municipal concerns, 56 have been permitted to instal more plant, but only 20 company concerns. The plant at the 56 municipal stations at June 30, 1914, was equal to 500,071 KW.; and the additional plant sanctioned or installed up to Oct. 31 last was 645,072 KW. The 20 company concerns had, at June 30, 1914, plant equal to 351,685 KW.; the additional plant installed or sanctioned up to Oct. 31 was 324,453 KW. In 1914, the units sold by the 56 municipal undertakings totalled to 802,333,100; while in 1917 the number was 1,384,185,750 units—an increase of 581,852,650 units. The 20 companies in 1914 sold 691,116,312 units; in 1917, 1,160,337,146 units—an increase of 469,220,834 units. Looking down the list of undertakings, it is seen that they are mostly in industrial, and therefore munition, areas; so it may be expected that there will be a fair amount of spare plant on hand with the cessation of munition work. This is a factor in the electrical situation the measure of which time only can disclose.

MODERN WATER-TUBE BOILERS IN GAS-WORKS.

By E. DAVIES, of Beckton.

IN the latest type of water-tube boilers now being supplied to gas undertakings for the steam supply to blue water gas plants, some new departures by the manufacturers certainly deserve some attention.

Foremost is the fact that only the two bottom horizontal rows of tubes are solid-drawn or seamless—the remaining upper rows being of the welded type; so that it behoves a very careful examination being made of the latter when undergoing the hydraulic test after erection on the site. Another innovation is that the caps or handhole fittings on the headers are placed internally instead of externally, as was formerly the case; the obvious advantage being that the boiler pressure is forcing the caps on to the face instead of off, as when placed externally. On the other hand, the machined faces on the headers, being inside, are not as accessible for cleaning; and seeing that each cap joint has to be made with a special thin composition gasket known as "Durite," the cost of the renewal of these every time the tubes are cleaned will prove an expensive item in the upkeep—108 being required for the 54-tube boiler and 360 for the 180-tube one. It is rather surprising, too, to find out, after erection, that no low-water alarm has been supplied with these boilers. On the matter being raised with the makers, the purchaser is informed that, as the water-tube boiler is a safety boiler, this mounting can only be supplied as an extra; and this necessitates the cutting of a hole in the steam-and-water drum by hand, *in situ*. This is a very essential fitting, as frequently a boiler fireman has other duties, such as attending to feed pumps, &c., or the boiler may be a gaseous fired one on the top of a retort-bench, and in charge of the retort-house foreman, in which case a high and low water alarm, set to come into action at a 4-in. range above and below the working water level, is indispensable.

The great advantage of the water-tube boiler over a Lancashire boiler in a gas-works is that steam can be raised within an hour in the former, while five to six hours are required with the latter. To minimize the deposit of scale in the tubes and mud-drum, it is good practice to make frequent use of the blow-out; and a disadvantage with the water-tube boiler is that the operator, when performing this duty, is out of the range of vision of the water-level gauges, owing to the position of the blow-out. Because of this, the parallel slide-valve is not a suitable type for this class of boiler, as sediment may get under the valve-disc and deceive the operator into believing that he has closed the valve properly. When a plug-cock is used for the blow-out, the body as well as the plug should be made of gun-metal, as with the sudden change of temperature, when being used, the plug is very liable to expand and seize, and cause difficulty in closing the cock and the water-level to rapidly lower in the meantime. The plug should always be turned the complete circle in opening and closing, as if only moved the half-circle grooving is certain to ensue somewhat rapidly.

The periods for cleaning the tubes vary very much according to local conditions and water used. The writer has dealt with boilers where the tubes needed cleaning only once every twelve months, and others where ten weeks was the limit. It is the safest course, however, to remove a cap or two on each of the three lower rows (say) every 13 weeks where tubes are only cleaned annually. That this is essential is evidenced in the recent water-tube boiler explosion at an East Coast gas-works, in which considerable damage was wrought. At the investigation it was found that this boiler had been working continuously for ten months since its last cleaning. The mud-drum and two bottom horizontal rows of tubes contained a solid mass of deposit; the water circulation, it is assumed, having only been taking place in the upper rows of tubes for some time prior to the mishap. Another interesting feature was the discovery of a glowing mass of fuel embedded between the upper row of tubes and the steam and water drum—probably the result of shallow fuel depth and excessive forced draught.

Removal of Regulations.—The "London Gazette" last Tuesday contained a long list of Defence of the Realm Act regulations which have been wholly removed. These include the power of a naval or military authority to require the extinguishing of lights, and the restrictions on the unauthorized use of authorized lights, and on displaying lights, &c.

Temporary Increase of Charges Act.—The Board of Trade have made Orders under the Statutory Undertakings (Temporary Increase of Charges) Act in favour of the Rochford Gas Company and the Wakefield Gaslight Company. Applications have also been made to the Board by the Garw and Ogmore Gas Company, the Shrewsbury Gas Company, and the Tenterden and District Gas Company. The Local Government Board have made further Orders under the Act for the Ashborne Urban District Council, increasing the maximum price from 3s. 4d. per 1000 c.ft. within the district to 4s. 7d.; the Birstal Urban District Council, with an increase from 4s. 6d. to 5s. 7d.; the Borough of Morley, from 4s. to 5s. 6d.; and the Teignmouth Urban District Council, from 4s. 6d. to 5s.

RECONSTITUTION OF THE NATIONAL GAS COUNCIL.

ORGANIZING THE GAS UNDERTAKINGS.

IT may be taken now that the old National Gas Council is dead, or only in existence for bringing into being the new Council, which, in the main, will be composed of elected representatives of the gas undertakings of the United Kingdom. Considering the importance of this matter, the discussion of the scheme has not taken long before securing final acceptance. This was given at a meeting, held under the auspices of the expiring Council, on Thursday last, in the Small Queen's Hall, Langham Place, W. The invitation to be present had been sent broadcast to all gas undertakings in the Kingdom; and we saw England and Wales, Scotland, and Ireland, represented splendidly. The President (Mr. H. E. Jones) surveyed the well-filled seats with evident pride and pleasure; and so did the Chairman of the Executive Committee (Mr. D. Milne Watson), who has rendered notable service in obtaining a properly representative and authorized body for the industry. Finance, administration, and the executive work—technical and commercial—of gas undertakings were all there. It is certain (this composition proves it) that there is a spreading recognition as to the need for proper and effective organization. There was marked interest shown in the proceedings, which interest grew into a "unanimity," made imperfect by only one vote, in adopting the scheme embodied in the Constitution and Rules published in the "JOURNAL" for Nov. 12. There have been a few modifications in phrases, but not of an importance to interfere in any way with the general outline of the scheme.

But now to the report of the proceedings.

The CHAIRMAN (Mr. H. E. Jones), in opening the proceedings, remarked that it was evident that the room was filled with those who felt interested in the very important discussion that was to take place on the new departure proposed. It was quite clear to him—whatever some of his friends might think—that the time for uniting even more firmly, and by stronger ties than before, had arrived, and that they must bring the whole industry, both company and municipal, into one bond. For the purpose of doing this, as Mr. Alderman Phillips had very shrewdly remarked on a previous occasion, the existing body was not sufficiently direct in its representation of the interests concerned. To secure what was desired, Mr. Milne Watson and the Committee had devoted a great deal of time to the subject, and had gone thoroughly into it, and as the result had brought forward a scheme which, on the whole, must be accepted as being a good and sound one. It did not interfere with matters which should be reserved for the independent judgment of the various undertakings themselves. It did not propose to deal with labour, except by assisting in the formation of a Labour Committee. But there were many things—like bringing the industry into touch with the Government, and legislation, and controlling authorities—which were essentially such that an organization of the kind they were forming that day would be very much better qualified to deal with than so many separate, divided, and random undertakings, no matter how large or important they might be. The scheme had been very carefully prepared. Mr. Milne Watson was at the root of it; and he would call upon him to explain the proposals. All he (the Chairman) could do was to congratulate those present on not having wasted their time; for the audience he saw before him was a very representative gathering indeed of the whole industry of gas, so far as he personally was acquainted with it.

THE MAIN POINTS OF THE SCHEME.

Mr. MILNE WATSON said they had been called together to consider what they were going to do with reference to the future organization of the National Gas Council, and therefore of the gas industry. They would recollect that two years ago questions were pressed upon the industry which it was felt could not be dealt with by the individual bodies at that time holding the field—the Institution of Gas Engineers, the British Commercial Gas Association, the Gas Companies' Protection Association, and the Society of British Gas Industries; and, in order to tackle the matters which thus arose (points connected with coal in particular), it was felt that some central organization representing all the interests was necessary. Accordingly, in the autumn of 1916 the National Gas Council was formed. It was created as an emergency measure. Time was short; questions were pressing; and therefore there was no opportunity to thoroughly re-organize, if he might say so, the whole industry. Hence, a short cut was made, and a National Gas Council was formed, which consisted of the four bodies he had mentioned. Very soon they found that this body was limited in several directions by being a nominated rather than an elected one; and in order to widen the interest, and to make the Council more representative, advantage was taken of a provision which enabled them to co-opt members on the Executive Committee. In the autumn of last year they asked the District Gas Associations to nominate various members representing them, who would become members of the Executive Committee. This step had very satisfactory results. First of all, it had had the result that they had been able to get in touch with the feeling of the country at large in regard to gas matters. Secondly, it had enabled them to derive much benefit from the advice of these gentlemen on the Council, But while this was a great step in advance, it did not altogether fill the rôle. The National Gas Council was still an unrepresentative body. It was still a nominated body; and as such it did not truly represent the entire industry. Two things arose from this. In the first place, they could never speak exactly as having had a mandate. It was true that they were very loyally supported by the industry as a whole, and that the Government Departments recognized them; but they did feel that they could not speak with the same authority as if they were a directly elected body. It had another weakness, also—that there were no means open to gas undertakings who did not agree with the policy being pursued by the National Gas Council of ventilating their grievances, except through letters to the Council or to the Press. This would be done away with by a representative National Gas Council, to which every gas undertaking would be able to send delegates. Then if any particular undertaking disagreed with the policy that was being pursued, the question could be raised at a meeting of the Council; and in this way the feeling of the industry as a whole could be tested.

When they set themselves to consider the best means of reorganizing, there were two sets of ideas put forward. One was that they should undertake the complete reorganization of every section of the industry—that they should reorganize root and branch. An attractive policy, no doubt, in other times; but he asked them to consider what would have happened if such a policy had been pursued now. There would have been the great difficulty to contend with that they would have had to consider the constitution, not of one body but of five—the National Gas Council and the other four organizations he had already named—because the basis of constitution was different in each case. The Institution of Gas Engineers, for example, was a personal body. It was composed of gentlemen who became members of a technical society, individually paying their own subscriptions. They were in no sense of the word representatives of their undertakings. They could not bind their undertakings. Over and over again, it had been stated that they could only speak as individuals. Next the British Commercial Gas Association was a big body with greater power. But it was limited to advertising; and to alter the basis would raise some very important questions. The Gas Companies' Protection Association confined itself to companies, and excluded municipalities. The Society of British Gas Industries was composed of gentlemen who sold gas plant and apparatus, and who therefore could not possibly return representatives on the basis of so much gas sold. Thus they would see at once the great difficulty there would be in what might be termed a "root and branch" reconstruction.

But they must not think because he had shown them the difficulties, that he was out of sympathy with root and branch reconstruction. He did, however, ask them whether this was a suitable time in which to indulge in such an operation—whether at the end of the war and the beginning of a period of important general reconstruction, they wanted to argue and occupy their time in discussing the constitution of five distinct bodies. He claimed to be an optimist; but he did not believe such a task would be finished before this time next year. In the meantime, were they going to leave alone their great industry—barring water, the oldest organized industry in the country? For the sake of the principle of "root and branch," were they to leave themselves open to the sort of attacks which they knew were going to be made upon them in the next twelve months? Other matters than those so far dealt with would have to be faced, and should be faced speedily; but, he said, "for heaven's sake do not let us stop at the present moment, when we are engaged in such tremendous issues, to discuss questions of that kind." ["Hear, hear."] He might say at once—so as to prove that the Executive Committee and the National Gas Council were not out of sympathy with this "root and branch" idea—that they had agreed that day that, if the National Gas Council were reconstituted, as they hoped it would be, a Committee should be set up immediately, consisting of a few representatives of each of the five bodies, to meet at a round-table conference, and discuss the possibility of some scheme for further unification. He did not want to argue about the relative merits of various other bodies. It was settled two years ago, when the

industry demanded a separate organization, that the National Gas Council should be representative of all the branches. So much for the difficulties.

Now, the reorganization scheme proposed had these principal features. It provided for a complete change-over from a nominated to an elected representative body. If they accepted the constitution now placed before them, they would have a truly representative body. All gas undertakings in the country, large and small, would have an opportunity of joining the Council, and raising its voices in its deliberations. This was a tremendous advance. They lived in democratic days; and this was a genuine attempt to make the National Gas Council a truly democratic and representative body. They all recognized that unity was force; but they were also aware that no unity could be successful without the fullest co-operation of the various members. Therefore under their rules they had provided for the establishment of District Committees. These District Committees would deal first and foremost with questions which were of particular interest to the districts; and they would also ensure that no matter would be settled on a national basis which had not received full consideration by the various districts. In this way, the interests of the districts would be guarded, as well as the national interests.

Another difficulty of the present National Gas Council had been that it had had no funds of its own. All that it had had to live upon was the subscriptions given to it by the four bodies who constituted it; and these had proved sorely inadequate. Owing, however, to the generosity, particularly of the British Commercial Gas Association (who had in the most handsome way come forward and helped to finance them), and also to the liberality of certain gas companies, they had been able to get through; but a body like the National Gas Council should have funds of its own, and feel that financially it was independent. This would now be secured by the proposed reorganization. The possession of funds would remove two great difficulties—namely, that they were not able to have offices which were suitable for carrying on the work; nor were they able to engage the services of officers to do their work. The Council had had to rely largely in the past upon the voluntary efforts of various members; and while these services had been cheefully and freely given, it was not right that the work should be done solely on this basis. There should be properly paid officers, who would be competent to watch over the interests of the industry. This had been secured by the method of subscription contained in the rules.

Another very important point to which he would like to refer was the question of labour. The industry found itself brought into close contact with organized labour; and the feeling among many of them was that they should be organized. The only way in which to deal with labour was to present a united front as labour did. In this connection, it had been suggested in some quarters that there was a great difference between municipalities and gas companies. With this, however, he disagreed. They all sold gas, and were all members of the gas industry; and he could not see there was really any radical difference between a municipally-owned gas-works and a company-owned undertaking. They knew perfectly well there were differences; but at the same time there were far more points of agreement than of difference; and surely, therefore, it was for them to go on the lines of agreement, rather than such little matters as there might be differences upon. And if it was said that one of these bodies was weak in dealing with labour questions, was it not then all the more necessary that the one which was strong should be present at conferences with labour. Labour was not divided. There was not a municipal labour party and a gas company labour party. Both the gas company and the municipal side were going to meet the same representatives of labour; and therefore, again, would it not be best for them to talk with a united voice? When they considered the matter fully, there could, he thought, be only one answer. At the same time, the National Gas Council recognized that it might be inconvenient and undesirable, even impossible, at the present time to expect the whole industry to unite on labour questions. Therefore they had carefully arranged that in the new rules there should be no attempt to make the Council itself the body to deal with labour. They had left it to a Labour Committee; and no one by joining the National Gas Council would in any way be forced to join the Labour Committee. It would be entirely a voluntary body. Undertakings could join or not as they pleased; but if they joined, they must be bound by the findings of the Committee. There was no desire for labour questions to be treated exactly alike everywhere, or that there should be one rule throughout the country. It was fully recognized that this would not be fair. There were different conditions in different parts of the country; and these ought not to be swept away. Therefore, they proposed that labour matters should be dealt with by districts—that District Committees should be set up, just as there were District Committees with regard to the main work of the Council.

He thought these were the chief points, except one very important one, which had been a great deal talked about lately. This was the position of the Society of British Gas Industries. There did not seem to be any question which had given rise to more feeling than had this particular one. To be quite candid, they had no desire to exclude the Society from their organization; but, as they were all aware, the present rules had the very invidious distinction that, while the Society of British Gas Industries might be, and was, a member of the National Gas Council, yet it had no power to elect to the Executive Committee. What did the experience of the last two years show? He wanted to be perfectly frank; and he thought if they examined the agenda papers and minutes, they would find that hardly on any occasion had they been discussing matters that had interest, at first hand, for the Society of British Gas Industries. There had been questions regarding supplies of coal, the sale of coke, benzol, ammoniacal liquor, dividends, standard prices, and so on, and questions of labour, which were subjects that the gas-making part of the National Gas Council could alone deal with. It was felt that it would not be a very dignified proposition of the present National Gas Council that this exclusion of the Society should continue. Therefore, pending further consideration of the unification of the industry, it had been decided that the best plan would be to set up a Joint Standing Committee of the National Gas Council and the Society of British Gas Industries. By this means, regular meetings would be held, at which all questions connected with the common interests of the maufacturer of gas appliances as well as the maker of gas would be discussed. The Committee would meet on equal terms; and it would be much more dignified than being members with the serious bar that they must not be elected to the Executive Committee. He well knew that opinions differed; but the Executive Committee of the Council would ask the meeting to accept this solution for the present. Let them see how it worked, and wait until the findings of the Special Committee were arrived at. He hoped that the Society of British Gas Industries would not think they were unmindful of their services. They recognized that they owed them a very great debt of gratitude for the work they had done. They recognized that they could not get on without them, and did not ever wish to get on without them. But they did want them to occupy a dignified and independent position, as against their present position; and this was why the Council made the new proposal. It was a solution which had been accepted by the Sulphate of Ammonia Association, who were in exactly the same position; and he believed that it would be accepted by the National Benzol Association which was being formed. Therefore, let them give a trial to the proposal before turning it down.

He thought he had really said practically all that was necessary with regard to the rules. There were, however, one or two points raised at the meeting of the Council that morning to which he would like to refer. In the first place, as to the districting suggested. It had been urged that certain areas—such as London and Lancashire—would not receive their full quota of representation on the Central Executive Board. If they turned to Rule 7, they would see that one of the duties of the Central Executive Board would be, when the new body came into existence, to discuss the question of districts, and divide or re-group, if necessary, to secure fair representation. Originally when the rules were drafted, it was suggested that they might leave out the districting altogether; but it was felt it would be better to use the present division. The sub-section to which he had referred made it quite clear that they might reconsider the matter. In connection with Rule 14, it had been agreed to make a slight alteration which he thought would be a great advantage. The rule dealt with the subscriptions, and was as follows:

> The subscription giving a gas undertaking a right to elect representative members of the Council in accordance with these rules shall be at the rate of 1s. for each million cubic feet of gas made by the undertaking in the account year preceding that for which the subscription is payable, or such smaller sum as the Central Executive Board may from time to time find necessary, but no subscription shall be less than one guinea per annum. Subscriptions shall become payable on Oct. 1 in each year. The Council may receive subscriptions in excess of those at the said rate, and may distribute the excess to any of the associated bodies, in accordance with the wishes of the subscribers.

It was proposed to strike out the word "smaller" in "or such smaller sum," and make it read "or such sum as the Council may from time to time find necessary," because the Council, as it went on, might find its income too small, and might wish in general meeting to alter the rate. As long as this was done in full Council, he could see no objection to the change suggested. It made for elasticity.

Before he sat down, he would like to make an appeal for unity. He would like to appeal to all of them to come into the scheme, and to make it a success. At present, enormous efforts were being made by the electricians to capture the field. They had spent no end of time, and were evidently spending no end of money, in propaganda. They had apparently got the ear of the Government ["Hear, hear."]; and Mr. Lloyd George and the Labour Party had put it as a plank in their platform. He believed many people thought if there was cheap electricity—or, if not cheap electricity, at least great central stations established—they would be able to have electricity at the most distant places. In fact, each farmhouse would have it to warm the farmer, and to cool or heat the milk, as the case might be. [Laughter.] But apart altogether from this, there was undoubtedly a feeling in the country that electricity was the thing of the future, and was going to save the country. Mr. Lloyd George, he believed, or someone in authority, had said that all monopolies should be taken over by the Government. As a gas industry, they wanted to have some say in this matter. As an industry, they had no objection whatever to electricity having its place in the sun; but they certainly did not think it ought to be allowed to march all over the country, and occupy fields which it was not suited to occupy, and which it would not be to the benefit of the country that it should occupy. There was at the moment being prepared a very important report,

which he hoped would be ready to be sent to the Government within the next few days, dealing with this aspect of the question; and one of the most interesting things arising out of this report was that, if gas was to be swept away or even given a back place, there would be an enormous increase in the consumption of coal in the country. Therefore, instead of it being a "coal conservation" scheme, it would be a "coal destruction" scheme. Was not a time like this one in which to sink all petty differences? Was it not a time—when the enemy was marching about with his battle cry of "Super Stations," and with the aid and assistance of Government Departments—for them to unite and make the Gas Army a really good fighting army? So that if ever they were attacked from a national point of view, they would have a national gas army to fight their battles; and if even the smallest outpost—the smallest gas undertaking in the country—was attacked, by electricity or any other person or thing, the enemy would feel they were going to be up against the whole force of the united gas industry. He appealed to them to pass the following resolution, and at any rate give the scheme a trial. [Applause.] He proposed—

> That this meeting of representatives of the gas industry approves and adopts the Draft Revised Constitution and Rules providing for the reconstitution of the National Gas Council, as printed, circulated, and amended.

THE SOCIETY OF BRITISH GAS INDUSTRIES.

The CHAIRMAN said that before the discussion was opened, Sir Arthur Duckham had something to tell them which would probably enable them, even better than before, to realize and discuss the problems of the day.

Sir ARTHUR DUCKHAM prefaced what he had to say by emphasizing the necessity existing for absolute unity. The case of the electricians, he said, was much simpler and more easily understood than that of gas. Then, again, he had not heard of the gas case being put before any Government Department by the industry; and therefore they could hardly blame the Government for not taking it up and pushing it as it ought to be pushed. As to the position of the Society of British Gas Industries, this was open to discussion. They had knowledge, enthusiasm, and money; and all these things should be used for the benefit of the gas industry whole-heartedly. He spoke for the manufacturers in saying that they were anxious to assist the gas industry. It was their only interest in the matter. The Council could go down to bedrock, and find out how they could best help. Let them give up little jealousies. They could not afford any jealousy or ill-feeling. Therefore, whatever solution was come to, he hoped everybody would abide by it whole-heartedly. They could not delay; the matter must go through now. Unless something was done within the next few months, it would be too late. He was certain the Board of Trade were only too anxious to receive any schemes for the betterment of the country. There was no feeling against the gas industry; and if the case was put forward clearly, with definite recommendations, he felt sure it would be considered. [He then proceeded to speak on other matters, which he desired should not be reported.]

The CHAIRMAN said they would agree that they had had a very profitable ten minutes with Sir Arthur Duckham; and it was a matter of congratulation to them all that they had in him a friend at court.

Mr. SAMUEL GLOVER [interposing] moved that the meeting tender to Sir Arthur Duckham their best thanks, and their promise to do everything they could to support him.

The CHAIRMAN remarked that he had been about to propose this himself; but as it had been done, he would second a very hearty vote of thanks to Sir Arthur for his attendance, and for the encouraging information he had that afternoon been able to give them.

The vote was cordially agreed to.

MR. MILNE WATSON'S MOTION SECONDED.

Alderman KAY said it would give him much pleasure to second the resolution moved by Mr. Milne Watson. There was very little left to be said, after the excellent explanation they had had of the scheme, and the remarks of Sir Arthur Duckham. Unity was the only thing they need think about; and he was perfectly satisfied that, with common sense and a little bit of give-and-take, they could arrive at an absolutely united gas industry. Given this unity, and given a cessation of the hostility which was latent in some places, and looking on the industry from the British point of view and that of the good of the nation, he thought that electricity would have a bad time. Gas had a good case; and it was better when put forward unitedly. Nothing so detracted from a case as a house divided against itself. Do not let them be in this position. He thought that, with the proposals now put forward, they would get over all the difficulties that had beset the organization in the past, and would meet in the future as a united gas industry, of which they would all feel exceedingly proud. Gas was the oldest organized industry in the kingdom—he did not even give way to water; and without any question, it was up to them to make the industry a credit to themselves as well as a boon to the country.

SOME QUESTIONS.

Mr. R. G. SHADBOLT said he would support the motion, with one very slight alteration. This was in connection with Rule 4, dealing with the constitution. Sub-section 5 referred to elected representative members; and he believed it had been considered at the meeting of the Council that morning. This was not one of the points mentioned by the Chairman of the Executive.

Mr. ALEX. WILSON asked whether the alterations could be indicated.

Mr. MILNE WATSON said sub-section 5 of Rule 4 read:

> Elected representative members shall be elected by the gas undertakings (municipal or company) of the United Kingdom and Ireland which subscribe to the funds of the Council in accordance with Rule 14, each such gas undertaking having the right to elect two representative members, one of whom may be a chairman, director, or member of the gas committee, and the other shall be a manager, engineer, or secretary of the gas undertaking.

They suggested putting in "or others"—"and the other or others shall be a manager, engineer, or secretary of the gas undertaking."

Mr. SHADBOLT: That meets my point.

Mr. JOHN KELLY (Bridlington): I think the resolution refers to the "rules as circulated and amended."

Mr. WYATT (Cheltenham) asked why the following footnote to Rule 6 was necessary:

> At an annual meeting the Council may, should they deem it desirable, elect a further member or members (not exceeding four) to the Central Executive Board.

What was the object of this, when they already had fifty?

Mr. MILNE WATSON replied that, if the constitution was studied, it would be seen that there was only one vacancy to each district every year. There might be a new man come into a district. Suppose a very distinguished man went from one undertaking to another, if there was no such provision by which he might be elected, some one would have to stand-down as a district representative to allow him to come on. The power given to the Council at their meeting to elect up to four members would meet a case of this kind.

Mr. S. O. STEPHENSON, referring to the provision that "the ex-officio members shall be the Vice-Presidents and Council for the time being of the Institution of Gas Engineers," &c., said that, if they were going to make a success of the National Gas Council, it required to be truly representative; and they did not desire to see a "packed" body. The Institution of Gas Engineers was more or less run—he did not say it offensively—by a clique. It was pretty well stage-managed in London; and if they were to support this scheme, he wanted it to be thoroughly representative of the whole gas industry, and not have an over-representation of certain gas undertakings. In regard to the districts, he presumed London was included in the Southern District; but he thought London was big enough and important enough to be a district in itself, and ought to be.

Mr. MILNE WATSON: That has already been explained. It is one of the first points that will be considered by the Council.

Mr. STEPHENSON: The interests of London are so totally different from those of other places in the South.

THE COMMITTEE OF EMPLOYERS.

Mr. CHARLES CARPENTER, D.Sc., said he would like to ask a question, not as representing the South Metropolitan Gas Company, but as a member of the Institution of Gas Engineers and of the Gas Companies' Protection Association. The point he wished to refer to was the one which was dealt with in sub-section 6 of Rule 3, relating to the formation of a separate Committee of Employers. They would remember the very distinct expression of opinion which was given by the Institution of Gas Engineers at the meeting which took place not very long ago. It would, perhaps, save some difficulty in the future if this matter was dealt with now, rather than postponing it to some other time. The conclusion to which the Institution of Gas Engineers came was to support the proposal for forming the National Gas Council, provided that a separate organization be formed for dealing with labour matters. This was the wording which was accepted unanimously by the meeting of gas engineers; and he suggested that it was very important that they should not put on one side lightly an expression of opinion from gentlemen qualified as members of the Institution were, who from the very fact of their training and position had been face to face with labour problems in many cases from their boyhood. He suggested that this had not been carried out in the drafting of the constitution and rules, and that in sub-section 6 of Rule 3, instead of the words "To form a separate Committee of Employers," should be substituted "To form as a separate organization a Committee of Employers." If they put these words in, they would not have broken faith with the Institution of Gas Engineers, but if they did not, unwittingly no doubt, he suggested that they would break this faith. It was one thing to set up a Committee that was not contemplated by the Institution of Gas Engineers; it was another thing altogether to form as a separate organization a Committee of Employers; and this was the conclusion to which the Institution of Gas Engineers came. He did not know whether he had made his point sufficiently clear, but he would like to know whether the change he had indicated was one which the Council could see their way to carry into effect.

The CHAIRMAN said it was quite immaterial.

Mr. CARPENTER replied that it was not immaterial to the Institution of Gas Engineers; and he might go further, and, at any rate, suggest that it was not immaterial from the point of view of the Gas Companies' Protection Association. The views, as he

understood them, of that body, were very similar to those enunciated by the Institution of Gas Engineers; and he suggested that there should not be any ambiguity whatever with regard to the matter.

The CHAIRMAN said they would accept it in the terms Mr. Carpenter wished. They accepted the insertion of the words, "To form as a separate organization a Committee of Employers."

Mr. CARPENTER remarked that, in order to carry out the spirit of this, they would have to modify Rule 15, dealing with the Committee of Gas Employers, in accordance with it. There he suggested they should repeat exactly the same words as those which had just been accepted as setting out one of the objects of the National Gas Council.

The CHAIRMAN said it could go in.

Mr. ARTHUR VALON presumed that the result of this would be to take the whole question of labour outside the National Council altogether—this separate body representing the gas industry in regard to such matters.

Alderman KAY: Unless it is distinctly understood in this meeting that this Council forms that organization, I will not second the resolution. The very object we have in hand is going to be defeated by the suggestion put forward now, because you will be setting up two organizations where one will do. ["Hear, hear."] Mr. Carpenter says a "separate organization." Surely, you cannot have an organization within an organization. What funds are you going to get for this purpose? What is the idea at the back of your head? I do not think it is quite right to make a statement and ask for a change of front at a meeting of this description, without giving some reason.

Mr. CARPENTER: There has been no attempt to make a change of front.

Mr. R. G. SHADBOLT: There is no change whatever; and I think really it is possibly a confusion of terms. In the draft we have, it is stated that a separate Committee is to be formed.

Alderman KAY: I accept a separate Committee.

Mr. SHADBOLT: A separate organization may mean a part or a whole. I think it is a confusion of terms.

Mr. KELLY: Mr. Carpenter said there was a breach of faith. Has the National Gas Council pledged itself to the Institution to accept a separate organization? If not, where is the breach of faith?

The CHAIRMAN: If we are going to include, as I hope, all the gas undertakings employing labour, surely there will be the same representatives, whether it was a separate Committee or part of the General Committee.

Alderman KAY: If Mr. Carpenter does not mean to have a separate set of officials, then I quite agree; but if he means, as he stated, a separate organization, then I disagree, because I cannot see how you are going to raise funds, or work the thing, unless it is done as a whole and with a united front.

Mr. CARPENTER: I cannot define it any more than to point out the conclusion of the Institution of Gas Engineers; and that is distinctly set out in the report—provided that a separate organization be formed for dealing with labour matters. I suggest that if you now substitute these words for the words you have already in the rules, you will not find yourselves in difficulties or in contradiction with the opinion so emphatically expressed by the Institution of Gas Engineers. I am not here to speak for or against it, but only to point out that this decision was come to as the result of discussion—I think, unanimously. I do suggest that an opinion of this kind, so expressed, cannot be ignored, however much anyone may disagree with it.

The CHAIRMAN said the rules prescribed that they should not themselves be a Labour Committee, but should form or constitute such a Committee from the undertakings which they represented. Surely, this did not necessitate speaking about two organizations. The personnel of the Committees need not necessarily be the same; but the Labour Committee must come from the same constituents, and use the officials of the Council. The resolution carried by the Institution could not bind the Council, of which it represented only one of the four constituent bodies. The Institution would not in any way occupy such a position as to dictate to the whole how things should be done. Though engineers might be the best judges of the men's work, they were not the best judges of the whole policy of how far gas undertakings should go in the matter of wages. The money had to be found by the shareholders.

Mr. A. E. BROADBERRY, speaking as a recent President of the Institution of Gas Engineers, and one who was present at the meeting to which Mr. Carpenter had referred, remarked that he wished to say, on behalf of the Institution, that he differed absolutely from Mr. Carpenter in his understanding of the resolution passed by them. Mr. Carpenter then took exception to the scheme, which was to form a Committee of Employers, which was absolutely a Committee of the National Gas Council. The way in which it was put before the meeting led the meeting to understand that anyone joining the National Gas Council would thereby be pledged to join the Committee of Employers; and it was agreed at the Institution meeting that we should ask that it should be a separate Committee, and that membership of the National Gas Council should not in itself compel any subscribing undertaking to join the Committee of Employers. The words "separate Committee," as introduced in the draft rules, amply covered anything contemplated by the meeting of the Institution of Gas Engineers. [Applause.]

Mr. T. HARDIE said this separate Committee which was to be formed was not really a Committee in the ordinary sense of the term. A Committee was a body which had to defer to the Council. The Employers' Committee would not defer to the Council. The Committee themselves would decide the policy, and meet the men and arrange terms. Therefore he thought if, instead of calling it a Committee, they called it an Association, this would get over the whole difficulty, and make it clear that what they were forming was not a Committee of the Council, but an Association of Employers to deal with labour questions.

Alderman PHILLIPS said he did not think they need labour this point, because there was nothing in it. The Whitley report proposed the formation of National Industrial Councils, which should be composed of equal numbers of representatives of employers and workers. Under this scheme, which the Government were pressing forward, these Councils would deal with questions of labour and wages. Were gas undertakings going to take a line apart from that which was being taken by all other industries? If so, he could understand the amendment; if it was not so, he could not understand it. Electrical, water, and tramway concerns, and the uncertified undertakings of municipalities and district councils, together with the chemical industry, were among those who had already founded Councils upon these lines. He expected the gas industry were going to act similarly; and then they would have no need of an amendment which would only lead them into the wilderness.

The CHAIRMAN: Unless the amendment has been seconded, I must rule it out.

Mr. CARPENTER: It is a definite proposal.

Mr. A. W. OKE: For the purpose of discussion, I will second it.

Mr. CARPENTER: May I correct one mistake that Alderman Phillips has fallen into? I know nothing about the electrical or water industries, but I do know that the chemical industries have formed an absolulely distinct Association for dealing with matters in a precisely similar manner to what I had in my mind when I made the suggestion at the Institution of Gas Engineers.

On being put to the vote, only one hand was held up for the amendment.

THE RESOLUTION CARRIED.

Mr. S. SHADBOLT (South Bank) said that clause *d* of Rule 3, referring to the objects, read: "To make provision for dealing with differences between members of such Committee and their workpeople." He would like to ask that the last word should read "employees."

The CHAIRMAN: It is not much use polishing-up all these periods. I think we can put the resolution.

Mr. MILNE WATSON: I should like just to say that we agreed this morning that the District Management Committees should have the right to co-opt, in the same way as the Central Executive.

Mr. A. W. BROOKS (British Gas Company) said the subscription was based on the quantity of gas made. Some undertakings, by reason of their geographical position, were burdened with a heavy leakage; and he would like to see the subscription based upon the quantity of gas sold.

The resolution moved by Mr. Milne Watson was then carried *nem. con.*

Mr. R. G. SHADBOLT said he wanted to suggest that the Executive, in fixing the time and place for the annual meetings, should consider the advisability of meeting in the industrial centres, in addition to London.

The CHAIRMAN: That will be considered.

The proceedings were then brought to a close with votes of thanks to the Chairman and to Mr. Milne Watson for the work he had done.

Yorkshire Junior Gas Association.—The Association are to have their annual meeting next Saturday afternoon, at the Leeds University. After the adoption of the report and accounts, and the election of officers, the new President (Mr. E. L. Oughton, of Longwood) will deliver his address.

Removal of all Calcium Carbide Restrictions.—As from the 1st inst., restrictions relating to the sale or purchase of calcium carbide are removed, subject to a maximum price to consumers of £40 per ton for quantities of 1 cwt. and over (granulated, 10s. per ton extra). No application for the use of this material or returns of stock need now be made to the Ministry of Munitions. It is anticipated that supplies are available for all purposes; but should the exigencies of shipbuilding demand it, the Government reserves the right to give preferential deliveries.

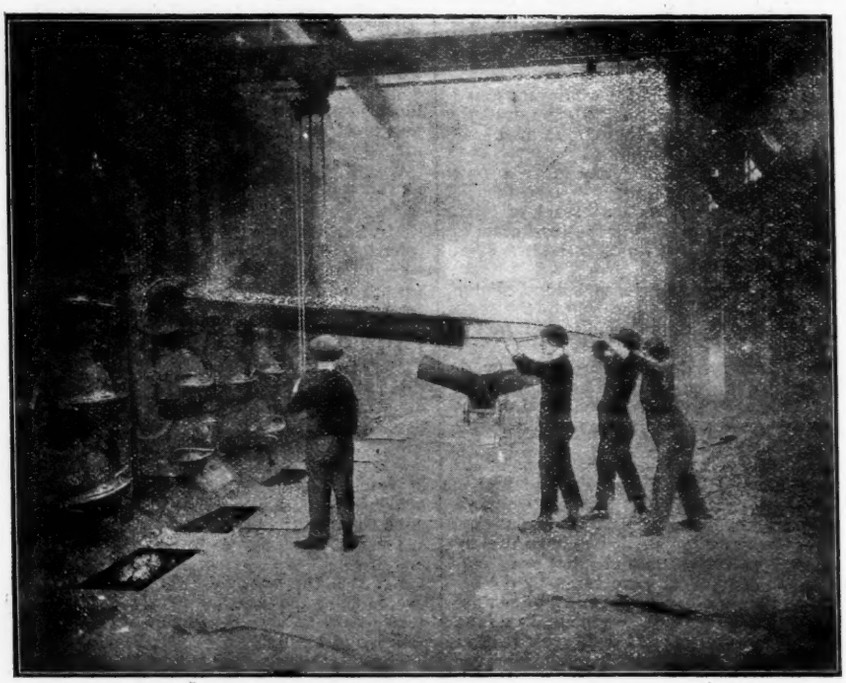
Fire-Clay in Northern Ontario.—An analysis of a sample of white clay from a bed on the Mattagami River, Northern Ontario, has, says the "Board of Trade Journal," been made in the laboratories of the Mines Branch at Ottawa. The clay is situated near the foot of the Long Rapid, and is exposed for a length of 700 ft. along the bank of the river; and is at least 8 ft. thick, but continues below the water level. A deposit of similar clay occurs on the same river twenty miles further south. The report on the clay by the Mines Branch states that the material is highly refractory, as it does not deform when raised to the temperature of the softening-point of Standard Cone 33 (3254° Fahr.). This is the first record of the occurrence of a No. 1 fire-clay in Ontario; and there are few clays as refractory as this in Canada, as far as is known at present. The working qualities of the clay are good; and shrinkage in drying and burning are within practical limits.

THE WOMEN GAS-WORKERS OF WOKING.

A Scoop-Charged Retort-House and Water-Gas Plant Operated by Women.

By a "JOURNAL" REPRESENTATIVE.

A RUN down to Woking a fortnight ago brought the writer into a town with its streets heavily decked with the emblems of peace rejoicing and loyalty. The objective of the journey was the works of the Woking District Gas Company; and, walking through the streets, the writer ruminated over the fact that—if what he had heard was true, and he was going to test the truth for himself—had it not been for women coming in to fill the breach in the man power of the Company, Woking would have found itself in dire straits for gas, for both the works and the district department, report said, had been rendered almost destitute of men. Writing now after the visit, it can be said that the Company and their Manager (Mr. W. H. Ely) may be reckoned among pioneers, for they have shown an enterprise which has demonstrated most completely the capability of women in a works of the smaller order—say, over 100 million cubic feet of output—with a retort-house without the advantage of machine operation as possessed by the Vauxhall and other retort-houses where women are to be found carrying on the work of the absent men. The Woking gas plant and its women operators, under the control of Mr. Ely, Ministry of Munitions, and Mr. Thomas Curr, the Engineer of the Vauxhall works, famed for inaugurating women retort-house labour on a large scale. The result was that, through the interest and enthusiasm of the Chairman of the South Metropolitan Gas Company (Mr. Charles Carpenter, D.Sc.), it was arranged (in conjunction with the Ministry of Munitions) that twelve retort-house women from the Vauxhall works should have their already good qualifications extended to hand work, and that they should go to Woking as demonstrators, and to train other women for the work. As soon as the women the Company already had in the yard saw the ease with which the Vauxhall women coped with the retort-house work, they volunteered to go into the retort-house; and retort-house hand-rake work and scoop-charging now form the height of ambition for the women. Within three weeks or a month, the Company had their own women trained and into the retort-house, and the yard women supplemented by new hands. Some of the demonstration women from Vauxhall left in four weeks; and the others a little later. This shows that where there is the will, there is a way, even in satisfying the claims of hand-worked retort-houses where men are not available.



WOMEN CHARGING THE HORIZONTAL RETORTS.

have proved something which has not been proved before, and which has shaken out of all shape the old belief that women are physically unsuited for the performance of the operations of a works of this description. Victory belongs to the Allies; and men will, as opportunity affords, be returning from the shores of France and Belgium and the more distant oriental fields of battle. Nevertheless, what the Woking Gas Company and its women workers have done deserve to be placed on record, if only as an example, and to give credit where it is due.

DEPRIVING THE COMPANY OF MEN.

On reaching the Company's offices, the writer had a preliminary chat with Mr. Ely. He learned how hard the Company had been hit for men through the war; and it is very clear that the Manager and the Directors have had no bed of roses since the war started, but have had to tax their wits severely to keep things going. At the outbreak of war, the stokers were all reserve men. They had to go. Then the Company had to pick up such labour as they could; and, in turn, the new men were taken. The next step was to ascertain what could be done with Class "W" men—discharged soldiers unfit for military service. But here again hopes were doomed to disappointment. There was no other course left open but to see what could be accomplished by the aid of women. The Company were not without experience of women. They had been employed in other of the works' processes and operations. But the scoop-driven retort-house was the thing at which Mr. Ely and the Board of the Company had shied in resorting to women labour. However, something had to be done; and so there was an interview with Mr. S. R. Chichester, of the

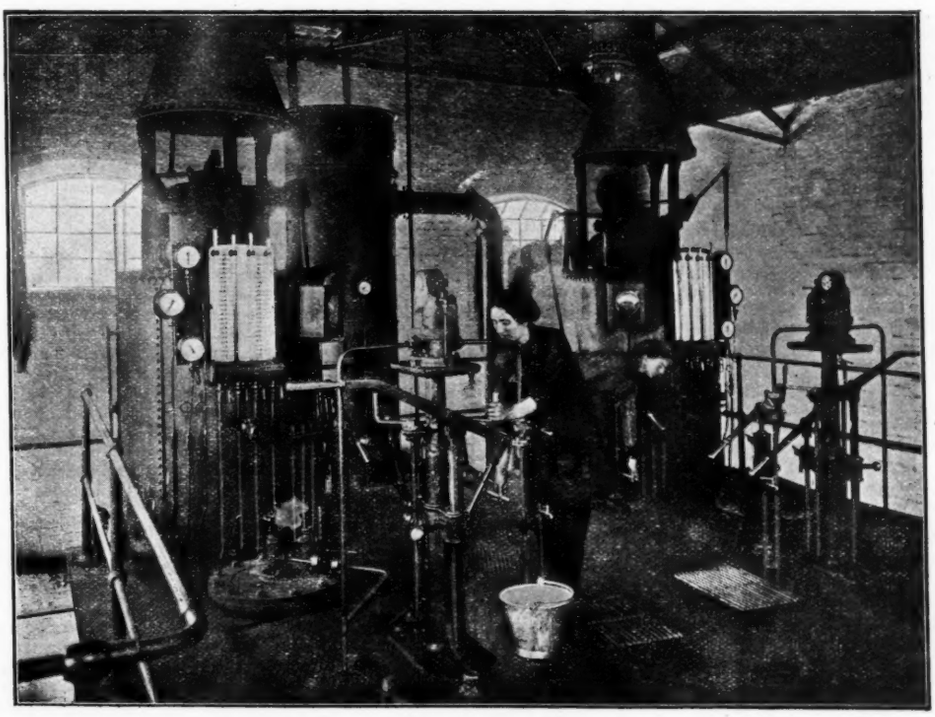
TIME AND HEALTH.

There was one thing that Mr. Ely at first rather feared; and it was that there would perhaps be some difficulty in getting the women to report for duty, especially for the night shift. His fears have proved entirely groundless. There are twelve retort-house women; and they work in gangs of four per eight-hour shift. They have shown a conscientious regard for duty; and from the day they started, they have gone straight on consistently doing the charging and discharging and pipe clearing, with a hand willingly given by a man if there is a particularly hard pipe that requires attention. In this connection it is gratifying to be able to record how well the men (on having the position explained to them) cheerfully responded, and assisted in making a success of the policy. Only on one night was there any trouble, but not since. Even at ten o'clock on Sunday evening, the women turn up with excellent regularity. In fact, said Mr. Ely, the punctuality with which they report for duty is a great credit to them. On the day when the armistice was signed, and the ceasing of hostilities put most people into a mood to rejoice together, the women gas workers stood absolutely stedfast to their posts. They have not suffered from illness—nothing more alarming than influenza. They all—with their four hours' work and four hours "off" in an eight-hour shift—look healthy; and the sprightly and happy way in which the writer saw them going about their work is evidence that they are so, and that they do not find the work exhausting or at all beyond their strength. In fact, when questioned, one of the retort-house women assured the writer that they did not feel the work to be in the slightest degree beyond their physical capacity.

THE RETORT DISCHARGING OPERATIONS.

INSPECTING OPERATIONS IN THE RETORT-HOUSE.

The writer crossed over to the retort-house, to see for himself what Mr. Ely had described. The house was found to be a stage-floor one, containing six beds of sixes and three of eights—all 22 in. by 16 in. block-ended retorts. At the present time, the make of gas is 1,813,000 c.ft. per week. Discharging is done by hand rakes; charging by scoops, raised and lowered by chain-and-pulley tackle, suspended on a traveller. The charges average 3 to 3½ cwt. The keen way in which the "gang" of four women were performing the several functions under the conditions of scoop charging and rake discharging was quite as much an eye opener as was the work on a larger scale that was previously seen at Vauxhall. We are certain that if this was a machine-worked house a couple of girls per shift could well do all the discharging and charging. The writer saw some of the charges cleared from the retorts. The lids were released, fired, and opened. The rakes were deftly handled, and got well home into the charges. The retorts were cleared, and the pipes augered. The remnants of discharged coke that had not passed down the shoot were shovelled away. The scoop containing its 3½ cwt charge was hoisted by chain and pulley; the travelling beam from which the tackle is suspended was run along to bring the scoop before the retort to be charged; with briskness the level of the scoop was adjusted, and run into the retorts by a couple of the women, turned, and brought out again with all the good form that men of long training can show. And these women have only been on this "job" some four months. The lid was closed, and fastened; and while other retorts were being cleared by two of the women, the scoop was being refilled by the remaining two. Several retorts were seen both drawn and charged. These four women each draw are now doing fifteen retorts; and they get through the work comfortably in an hour—having charged the retorts with upwards of 2½ tons of coal. After what was seen here, the writer intends relegating to the fearful accumulation of abandoned misconception any belief he may have formerly entertained that this was work that could not be negotiated by women.



ON THE OPERATING FLOOR OF THE WATER-GAS PLANT.

ATTENDING TO THE WATER-GAS PLANT.

WOMEN IN ALL OPERATIONS.

The writer passed from the house a wiser and better informed man as to women's capabilities in this direction than when he entered it. In the yard, it was observed that there was hardly a man to be seen—women in their overalls seemed to be everywhere. "Here you see," said Mr. Ely, "the coal comes in by barges on the Basingstoke Canal. From them the coal is raised by crane and grab, and put into skips, which women run across to the boot of the elevator which raises the coal up to the stage-floor of the retort-house. Over there you see we have women doing the coke-work. The purifiers are also emptied and filled by women. Here this one young woman looks after the whole sulphate of ammonia process. It is a direct-recovery plant, supplied and fixed by the Wilton Chemical Engineering Company. Women also superintend the engines and exhausters, which are cleaned and lubricated by them. The ordinary works' boilers are looked after by men fairly well advanced in years; but you will see presently that the water-gas plant boiler is under the care of a woman. The stores are also managed by a woman."

In passing, too, Mr. Ely told how when first the Company had women retort-house labour, a hostel had to be arranged for to accommodate them, owing to the large number of munition people working in the area. But this has since been done away with, as the women who are now employed have been able to get homes near the works. In addition, the Company have erected a mess-room on the works for the use of women only; and one maid constitutes its "staff."

WATER-GAS ALSO PRODUCED BY WOMEN.

Across the yard we came to the water-gas house, in which the writer found installed a duplicate plant, each set being equal to 200,000 c.ft. per day, erected by Messrs. Humphreys and Glasgow. This is run entirely by women, including clinkering and attention to boiler, blowers, pumps, and everything. For some eight months the whole of the water-gas plant has been operated by women without a hitch, and with the utmost satisfaction. There are three women on this plant. The forewoman, who did not know anything about water-gas plant eight months ago, but who has since taken a keen interest in it, has charge of the work on the operating floor, assisted by the wife of another absent soldier (soldiers' wives have a preference here), and a further woman assistant looks after the boiler and auxiliary plant. Everything about the plant looks spick and span. There is a touch of domestic order and cleanliness introduced into manufacture, and the operating floor is by no means an uncomfortable place. The work is done with precision; and the forewoman told the writer she found no trouble whatever in connection with it. In the morning blue water gas is always made, and in the afternoon carburetted water gas. While talking to the forewoman, it was learned that on the works there are at present 23 women in all, twelve of whom are on the retorts, three on coal, two on coke, three on the water-gas plant, one on sulphate making, one on engine supervision, and the mess-room maid.

CLERICAL AND COLLECTING STAFF.

The clerical staff, it was heard, are all of the "fair" sex, and all the collecting is done by women. So Mr. Ely, as he himself puts it, has lost all his men from A to *Z*.

However, Mr. Ely has proved that, in a works such as that at Woking, satisfactory operation can be pursued (as the writer witnessed) by the aid of women. They are a very happy family away there at Woking; and, what is more, there has been no cessation in the gas supply. Without women had come to the rescue, it was inevitable that there would have been at Woking. Those of the "boys" who return home will find their old places there still; but we can well understand that with the deepest regret the Company will part with those of the women who will in time have to go, and who have helped so "manfully" to maintain gas output and supply during the days when war was being waged at the highest intensity. They have done, and are doing, well, and will do so until the last man has been liberated from the war.

Calorific Standard Fixing in the United States.

The Washington correspondent of the American "Gas Age" announces that the Government will not adopt the suggested 528 B.Th.U. standard for gas. Because of the difference of opinion between the engineers of the Fuel Administration and the experts of the Bureau of Standards, Dr. H. A. Garfield, of the United States Fuel Administration, has decided not to recommend the reduction of the gas standards of the country to 528 B.Th.U. The question will be left to the Public Service Commissions in each State; but the Fuel Administration will hand over to them carefully prepared statements of the information which has been secured through the Administration's investigations, and will ask them to weigh the arguments and be governed accordingly. This, it is felt, will leave the question to the local authorities, so that they may be able to deal with the gas companies in their respective jurisdictions. It is believed by the members of the Fuel Administration that this will help to answer the argument which was advanced against the change by the Bureau of Standards—that it would enable the gas companies to produce cheaper gas without cheapening the price to the consumer. The local commission can now make any reduction in standards which they may order a basis for fixing lower gas prices. The various commissions will be asked by the Fuel Administration, in coming to their decisions, to keep in mind the possibility of saving coal and oil. The conclusion of Mr. Garfield brings to an end a long controversy. For more than six months the question has been the basis of investigation and argument. There were innumerable hearings of all concerned; for it involved not only the gas producers, but also various governmental bodies. Besides the expert opinions given by the Bureau of Standards and the Bureau of Mines, the War Department took up the position that a reduction in the B.Th.U. standards might interfere with the output of toluol. This argument, however, which at the time the correspondent wrote was of supreme importance, was met by a project by which the War Department would undertake to supply at cost the additional oil necessary for toluol-producing plants, and receive in return a cheaper supply of toluol than would be the case under the old methods.

Gas from Straw and Flour.—It is reported by the Progress Committee of the Illuminating Engineering Society (U.S.A.) that a retort has been invented for carbonizing straw and other cellulose materials. A ton of straw will give between 11,000 and 12,000 c.ft. of approximately 400 B.Th.U. gas, and from 6 to 8 gallons of tar and ammoniacal liquor. Another radical departure in the production of gas is reported from France. A large tonnage of spoiled flour was salvaged from a torpedoed vessel. The flour was useless for bread-making; and it was turned over to the gas-works and distilled. From 5280 lbs. of flour, 11,200 c.ft. of gas and 1584 lbs. of coke were obtained; the latter leaving practically no ashes when burned.

Coke-Oven Practice in America.—In a review of the progress of the bye-product coke-oven industry in the United States, says the New York correspondent of the "Chemical Trade Journal," Mr. W. H. Blauvelt, of the Semet-Solvay Company, states that the number of bye-product ovens in America has increased from 4624 in 1911 to a total of 7660 in operation at the end of 1917, with 2800 building. This makes a total of 10,460 ovens, which will be in operation some time this year. In 1917, the total production of coke was 56,600,000 tons, of which 60 p.ct. was beehive and 40 p.ct. bye-product. Before the end of the year, the bye-product output will have passed the beehive output. Since the bye-product oven was brought to America from Europe in 1892, it has been radically improved; and from the point of view of American metallurgical practice, the American ovens are superior to those of Europe. The points of superiority are mainly those of larger units and larger output per unit, and the greater extent to which labour-saving machinery has been introduced. The increased output is largely due to the use of silica refractory material, which permits higher heats and shorter coking time than is usual in Europe. The modern American oven will carbonize commercially more than 20 tons of coal per day; and, contrary to the European idea that slower operation is necessary to conserve the plant, this rate of operation, with only current repairs, can be maintained for an indefinite time. There are a number of plants in different parts of the country, built 16 or 18 years ago, which are more efficient to-day than in the first year of operation.

SPRAYING METERS.

By B. R. PARKINSON, M.Inst.Mech.E.

REFERRING to the papers read at the recent meeting of the Institution of Gas Engineers [*vide* "JOURNAL" for Nov. 12], a number of inquiries have been received as to the apparatus used, and where it can be obtained. Mr. Walter T. Dunn, the Secretary of the Institution, has asked for this information to be published; and the Gas Light and Coke Company have kindly allowed the photographs to be taken which accompany this article.

The step which led up to the lubricating of meters with an oil-fog was the discovery of the beneficial effects of the paraffin vaporizer used for naphthalene prevention. This treatment is good for the protection of the distribution system against internal corrosion; and it is probable that as a remedy for various troubles our old friend "a drop of oil" has not even yet been fully exploited. The problem of applying the vaporization of oil locally and directly to the gas-meter, brought a number of suggestions and attempted methods, more or less crude, until attention was directed to the paint-spraying plant. This was to hand, and, with a little adaptation, proved to be both simple and efficient.

It may be repeated here that the action of the oil-fog on the meter is primarily to clean the valves, and secondarily to soften the leathers. It reduces slowness of registration, lubricates the working parts, and coats all the metal internally. The oil used must be pure, and leave no residue upon evaporation. It is designed to clean the slide-valves of the meter but on no account to thicken and clog the working of such extremely light mechanism. The following is a specification of ordinary gas oil such as is recommended for the purpose. American "Solar Distillate," specific gravity ·85 to ·87, boiling-point 220° to 395° C. Messrs. Alex. Duckham & Co., Ltd., of Millwall, have a gas oil of British production, specific gravity ·88 to ·89.

With the paint spray, the oil is atomized to the best advantage by an air pressure of about 35 lbs. per sq. in.; and when this is applied to the inlet of a gas-meter, the impetus is sufficient to work the meter, so that a few feet of the oil-fog will actually register on the index and issue at the outlet. If hand-pumps only are available, it is possible to spray with the same instrument at a pressure as low as 10 lbs. per sq. in. [It must not be misunderstood that this pressure is applied to the meter.]

The plant necessarily consists of compressor, receiver, and pistol (as it is called), with connecting tube, gauges, and other fittings. It may be well to add a condensation trap, such as the small receiver shown in fig. 1, to remove moisture from the air and ensure the delivery of the oil perfectly dry. The latter can be fed continuously from an overhead tank, or, if the demand be not sufficient, from a small cup attached to the pistol.

The pistol is constructed of two concentric tubes, the inner one delivering the oil, and the outer one the air. There is a needle-valve operating at the extremity of the oil-tube, and controlled by a lever which also commands the delivery of compressed air. Oil is drawn from the inner tube by the passage of the air, and becomes atomized as it is forced through a nozzle which surmounts the two concentric tubes. This process is in use for atomizing liquid coatings through a great range of specific gravities—even viscous substances. The fineness of the fog produced depends upon the construction of the pistol. Very delicate work is undertaken by similar apparatus for painting—such as retouching photographs, pottery designs, and art stencil work. Therefore the adaptation of the spraying pistol to an oil for cleaning and lubricating purposes does not present any novelty to the manufacturer, though it may open up a fresh field.

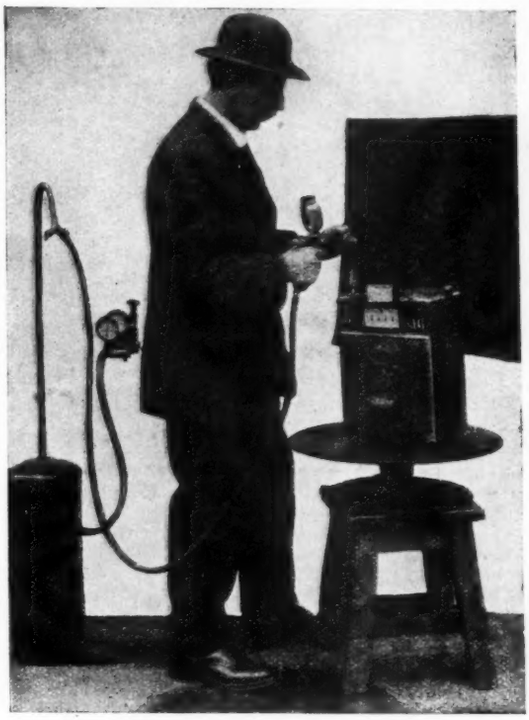


FIG. 1.

In applying the oil spray to the meter, the simplest way would be to put the nozzle of the pistol to the inlet, with perhaps a rubber or leather washer for temporary joint. This would result in a good deal of oil condensing in the inlet down-tube, which could afterwards be emptied back into the cup. It is better to have an extension-piece on the nozzle of the pistol, which passes down the inlet-tube of the meter and culminates in an elbow directing the spray along the horizontal passage leading to the valve-box. Fig. 3 shows one form of the extension-piece sepa-

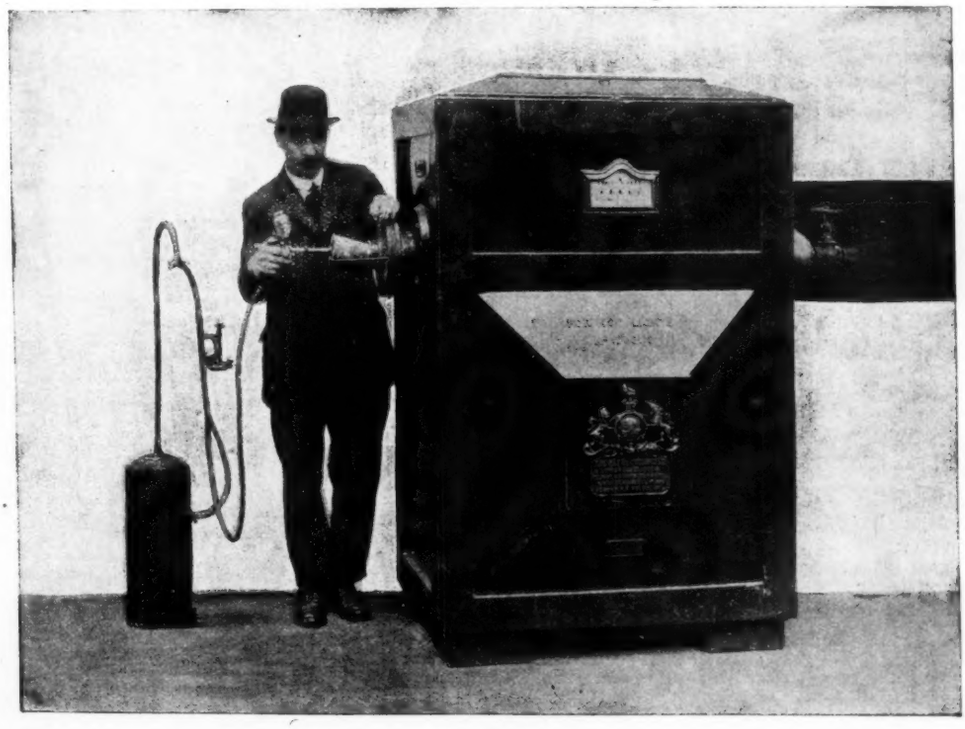


FIG. 2.

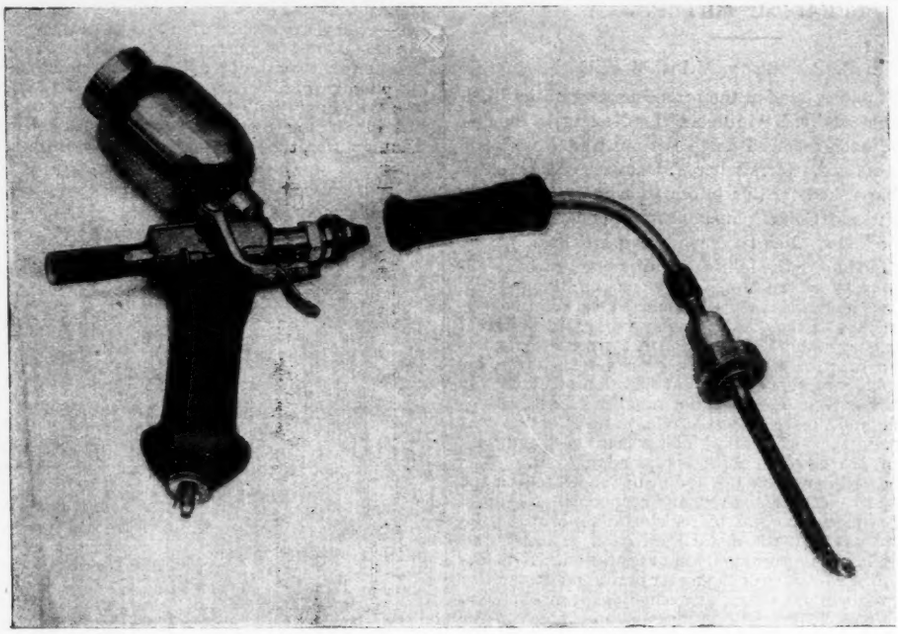


FIG. 3.

rate from the pistol. Another form is shown in fig. 4, designed by the Aerograph Company, who are taking up this line very thoroughly. Here the extension-tube, which is part of the pistol, is graduated to accord with the sizes of meter and a temporary joint is made by means of a collar and felt washer, thus dispensing with the union. It is usual to work the meter with the spray to the extent of one revolution of the testing-dial. If the work is done under cover, ventilation is, of course, necessary. Fig. 2 shows that it is possible to spray a large meter, and that in doing so it is well to restrict the outlet.

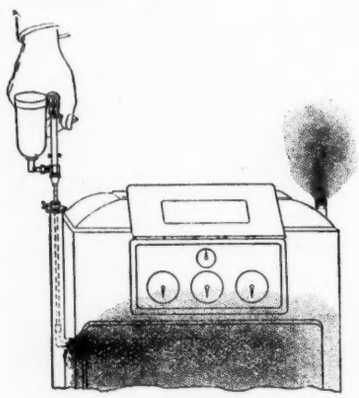


FIG. 4.

Here are very roughly the costs of the apparatus: The pistol alone costs about £6; plant complete with hand-pump and compressor and pistol, about £20. Double this amount would be required for a power plant including a small belt-driven compressor, which could be run either by a stationary engine or by the engine of a motor lorry, if a travelling plant were required. The following are makers or vendors of this class of apparatus: The Aerograph Company, Ltd., No. 43, Holborn Viaduct, London, E.C. 1. Airostyle and Lithos, Ltd., No. 35, St. Bride Street, E.C. The Airbrush Manufacturing Company, Ltd., No. 13, Arlington Street, Rosebery Avenue, E.C.

Safety of Incandescent Gas Lighting.—As the result of experience in the United States, it is contended by "Gas Logic" that one of the most serious and frequent causes of accident in the use of gas is the open flat-flame burner. A missing pin in the fixture will allow the burner-tap to turn round completely; and in removing the finger and thumb one may unconsciously turn the cock a trifle, thus permitting the unlighted gas to flow into the room. At times 25 p.ct. of the fatal accidents and 35 p.ct. of the non-fatal ones occur because of open burners. With an incandescent burner, if the cock is accidentally turned on while the light is being extinguished, the gas will, owing to the heat remaining in the mantle, be immediately relighted. For the same reason, it is extremely difficult to blow-out a mantle-burner light.

WHAT IS THE TRUTH ABOUT "STRIPPED" GAS?

By NORTON H. HUMPHRYS.

THE experiences during the last four years have roughly shaken-up many fetishes that had found general acceptance as fundamental truths, to the serious detriment of real progress in the gas industry. Repeated suggestions as to the need for investigation, research, an experimental gas-works, &c., have fallen on deaf ears, because the controlling parties, directors, and committee men were too fully occupied with other matters to look beyond next year's dividend, or contribution to the rates, as the case might be, or troubled with the delusion that the gas industry had attained an assured prosperity, sufficient to render such proposals superfluous. They thought it more to the advantage of the concern to economize in expenditure, and to have a smart business manager who would buy in the cheapest and sell in the dearest markets, rather than take a broader view and look further afield, to the possibility of increased competition, and such questions as the education of consumers to get the best value from the gas.

But bring in new and unanticipated conditions, such as have arrived in shoals during the last four years, and it will be evident that the position above outlined is not far removed from the "unpreparedness" that was so prominent during the early days of the war. The accumulated experiences of the past are displaced from the assumed position of a solid foundation for the future, and seen in their true light as at best a very indirect assistance towards the new methods necessary in order to effectively meet new conditions. The need for clear and definite information that can only be obtained by systematic investigation all along the line, is brought from an obscure position, where its real proportions were only discernible to those blessed with exceptionally good mental sight, to the full glare of the lime-light. The loss to the industry, due to the general state of ignorance in 1914, is so glaring that the importance of energetic steps towards a more satisfactory position takes prominence before anything else. The history, and the kaleidoscopic changes of views, in regard to stripping gas, is an important instance in point.

Everyone—including those who "ought to know"—was quite at sea, both as to the possible effects on business as affecting the gas undertaking, and on the convenience and pocket of the consumer. Knowing the customary lines of policy usually favoured by opposition, there was no surprise when the so-called representatives of the public interests advanced exaggerated estimates as to the loss to the users, and the profit to the gas company, that would be caused by the transference of heavy hydrocarbons from the gasholder to the tar-well, and that figures of an important character, based on the simple process of dividing the gross gas-rental by some absurd factor—25 p.ct. was in favour, for some obscure reason—should be in evidence. It was, however, more remarkable that experienced engineers, having nothing to guide them beyond a few exceptions when the supply of poor gas was unavoidable, did not favour the proposal—regarding it as likely to bring about no end of complaints in the district. There would be general dissatisfaction on account of bad supply, stoppage of gas-engines, striking-back of atmospheric burners, and popping of mantle-lights; and the collector would have a lively time. While none of these things materialized in any important degree, no

one foresaw the serious trouble due to the effects of "dry" gas on the consumer's meter. Even the Government inspectors, who went up and down the country so as to hearten-up the fearful and the unbelieving, had no weapon stronger than a contradiction of any fancy estimates. Taking the value of the extracts at 4000 units per cubic foot, they showed that the effect of removing 1 p.ct. would only mean a reduction of calorific value to the extent of 40 B.Th.U. per cubic foot, which does not much exceed fluctuations in quality as between one week and another, in ordinary working. What a different all-round effect would have followed, if these gentlemen had been able to study the Gas Investigation Committee's preliminary report, which shows that the needs of the Government could be met without prejudice to the interest of the user, and without any serious strain upon the resources of the outdoor department.

After four years' experience with stripped gas, which would not have been secured without something approaching compulsion on the part of the Government, what are the results? Perhaps we shall be reminded that the consumer, knowing the exigencies of the position, preferred to endure, rather than to seek a cure at the complaint counter, or was distracted by more pressing matters. Taking this for what it is worth, there is on record no instance of special trouble or increased complaints; and the undisputable evidence of the rental-books disposes of suggested loss to the customer. Excepting a few who were in a position to lay down and to work efficient oil-washing and debenzolizing plants, the profit obtained by the smaller class of gas undertakings has been a minus quantity. The small allowances they have received from the tar distiller do not cover the expense of altering plant, extra pumping, and loss of ammonia due to the necessity for commandeering some portion of existing scrubbing and washing arrangements. It remains to be seen whether a mutual scheme between distiller and producer, as already adopted in some districts, will offer sufficient inducement to continue the stripping process, or to replace present makeshifts with plant of a more efficient and permanent character.

To-day, with the experience now available, we are able to ask if the stripping of gas—conducted for the benefit of the Government, with that utter disregard of the interests of the gas industry, present or prospective, that has throughout been a remarkable feature of the Government attitude—should not be retained, and set on a permanent footing, for the benefit of the consumer. Some revision and adjustment of existing obligations would be required; and the extracts should be saleable at a price that would admit of consideration being extended to consumers. The "HC" may possibly be more useful to the nation for the preparation of dyes and fuel oils, than when consumed as fuel. We talk of the valuable substances that are destroyed—it would not be quite correct to say consumed—in the domestic fire-grate; and it seems that the same reasoning might be applied to "HC." This leads to the question, What is the value of "HC" to the consumer?

In an average 600 B.Th.U. coal gas, the calorific is made up somewhat on the following lines: CO, 30; H_2, 150; H_4C, 312; and HC, 108. Remove the whole of the HC, and a 492 B.Th.U. gas remains, from which we have good reason to believe that the user in practice would get as much value as from the original gas. It can be reduced, if desired, to 400 B.Th.U., or lower, by mixing with blue gas of 300 B.Th.U., or by barefaced adulteration with air or nitrogen. I do not go further into the question of "inerts;" being convinced that, apart from the objections due to the increased difficulty of distributing heavy gases, the consumer is sure to feel thal he is imposed upon, when it is set before him that he is charged for atmospheric or furnace gases at the full current price per 1000 c.ft. Extensive dealings with inerts will not add to the prestige of the industry, or in the long run to the prosperity of gas undertakings. These facts may be considered in conjunction with the preliminary report recently issued by the Gas Investigation Committee.

Physical Theory of the Incandescent Mantle.—The physical theory of the ordinary incandescent mantle composed of thoria and ceria has been fully treated by Rubens, who found the high efficiency of a mixture of approximately 99 p.ct. of thoria, and 1 p.ct. of ceria to be due to two causes: First, the low emissive power of the thoria, in virtue of which it attains a high temperature in the flame; second, the introduction of a rather sharp absorption (emission) band in the visible spectrum by the small quantity of ceria when hot. The addition of more ceria broadens the emission band—thereby contributing proportionately more infra-red energy. This increases the total radiation, and lowers the temperature so that the radiant luminous efficiency falls off again after passing through an optimum.

Official Regulations for Ganister Mines.—The Home Secretary has issued the revised draft of an Order setting forth regulations to be observed in the working of all mines under the Coal Mines Act, 1911, in which ganister or other stone containing not less than 80 p.ct. of silica (SiO_2) is worked, with a view to sale or manufacture. If the Chief Inspector of Mines is satisfied in respect of any mine that, owing to the special conditions of the mine or otherwise, any of the requirements of the regulations can be suspended or relaxed without danger to the health of the persons employed, he may authorize suspension or relaxation on such conditions as he may think fit. The regulations, which are in substitution for those that were made under the Coal Mines Act in September, 1913, are to come into force on Jan. 1.

POSITION OF THE GAS INDUSTRY IN GERMANY.

(*Continued from p.* 463.)

PROFESSOR BUNTE'S VIEWS.

Opening the discussion on Herr Körting's paper on the "Economic Position of the Gas Industry," Prof. H. Bunte said: The greatest evil from which we are now suffering is the short supply and the bad quality of coal. With the return of peace, some immediate improvement may be hoped for and expected. Improvement may be expedited if gas managers keep close check on the quality of the coal delivered to them, which quality connotes its value, as distinct from its price. The coal tax, according to the Statute, is a levy of 20 p.ct. of the value of the coal, and, with a poor coal, value and price stand far apart.

Last year, the German Association's Instructional and Experimental Works undertook that subscribers to its funds should be entitled to a free analysis four times in the year of samples of the coal supplied to them, with an opinion on the coal, provided the samples had been taken according to the general directions for sampling coal which were issued in 1911. But though only 100 of the circulars announcing this concession to subscribers were issued in the first instance, for fear that the depleted staff of the experimental works might otherwise be overwhelmed by the number of samples forwarded for examination, the fears proved unjustified, for up to the time of speaking, all told, only 31 samples of coal had been received and examined. Doubtless short staffs had in many cases prevented samples being taken in the careful manner laid down in the directions; but it appeared that the importance of analyses of coal is under-rated in many quarters.

There is no use of coal for which the supply of good coal, low in ash-content, is of greater importance than for gas manufacture. In boiler-firing, for instance, calorific power only is of moment, and an increase of 5 p.ct. in the ash merely reduces the calorific power by 5 per cent. On a gas-works, the disadvantage of high ash content is four-fold or five-fold, as it affects the economy of working in a number of distinct and serious ways.

Since most gas coals give a yield of about two-thirds of their weight of coke, it follows that the ash, all of which remains in the coke, is about one-and-a-half times as great a percentage in the coke as in the original coal. Thus coal high in ash deteriorates in higher measure the quality of the coke, which is the most important bye-product of the gas-works. This is an especially important fact in view of the growing competition of oven coke with gas coke—the oven coke being made from coal which has been washed for the removal of all slate or ash from it. The 33 samples of war-time coal supplies to gas-works had been classified in three groups, according to their ash-content; the first group comprising 8 samples with not more than 7 p.ct. of ash; the second, 11 samples up to 12 p.ct. of ash; and the third, 14 samples with more than 12 p.ct. of ash. The results of the laboratory tests of these coals are summarized in Table I. [p. 520].

The samples included in the table represent coals delivered to gas-works in all parts of Germany, and emanating from the Silesian, Saxonian, Rhenish-Westphalian, and Saar coalfields; and while the number of samples is too small for them to be thoroughly representative, nevertheless the results give a general idea of the quality of war-time gas coals and how they would behave on carbonization. It will be seen that 42 p.ct. of the samples fall into the third group of bad coals. The transport of coal of such low grade as these is much to be deprecated, in view of the scarcity of wagons and other transport difficulties. The ill-effect of the high content of ash is felt not only in the coke, which has to be sold, but also on the gas-works itself. The yield of gas is affected—the coals in the second group yielding about 5 p.ct. less gas than those in the first group. Therefore, in order to produce the daily output of gas, it is necessary to increase the number of retorts and settings in action, and the retort-house staff, by 5 p.ct. The consumption of coke in heating the settings is also increased by 5 p.ct., while repairs and renewals of plant are likewise extended. The yields of ammonia, tar, sulphur, and cyanogen as bye-products, fall per ton of coal in like ratio. Hence the ill-effects of dirty coal are felt repeatedly in a gas-works. It is supremely important that coal as free as possible from ash should be supplied to gas undertakings.

The bad coals, yielding coke with more than 18 p.ct. of ash, are specially obnoxious in view of the bad transport conditions, high freights, and the 20 p.ct. coal-tax. Every effort should be made by gas undertakings to secure coal low in ash; and systematic control of the coal delivered, especially in respect of the ash content, may go a long way towards nullifying the incidence of the coal-tax. It may be taken for granted that, even in prevailing conditions, a works which tests the coal delivered and takes up the question of its quality with the suppliers will get better coal than works which exercise no control; while knowledge of the quality of the coal is valuable to the manager in working it off to the best advantage. If nothing more is done in the way of testting, at least the coal should be classified into the three groups according to ash content. The trouble of sampling and the cost of testing have been proved by practical experience to be amply repaid by results.

Passing on to bye-products, Herr Körting has pointed out that the price of ammonia is likely to remain depressed through the successful development of the Haber synthetic process. There

Table I.—Proximate Analyses of Samples of 33 Coals Supplied to German Gas-Works, 1917-18.

—	No. of Samples.	Water, Per Cent.			Ash, Per Cent.			Real Coal (Ash and Water Free), Per Cent.			Yield of Coke, Per Cent.			Ash in Coke, Per Cent.		
		Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.
I. Good coals . .	8	4·0	8·0	0·9	5·4	6·9	3·8	90·6	94·7	85·7	68·5	79·1	58·0	8·0	11·0	5·0
II. Moderate coals .	11	2·7	7·5	1·1	10·0	11·9	8·4	87·2	90·2	84·1	70·9	78·7	61·1	14·1	17·0	11·9
III. Bad coals . . .	14	2·4	5·1	0·8	23·6	50·8	12·2	74·0	84·9	48·4	74·3	86·1	65·9	31·1	59·0	17·7

is also the competition of cyanamide, atmospheric nitrate, and Chili nitrate of soda. On the other hand, it has been found that the nitrogen in coal is under-estimated by the Kjeldahl process, which is commonly in use; and while carbonization on gas-works only converts 14 to 20 p.ct. of the nitrogen into ammonia, an increase to 30 to 40 p.ct. may be achieved by the application of present knowledge, even without the radical change of steaming during carbonization.

While Herr Körting regards the continuation of debenzolizing after the war as unlikely to be remunerative, it should be borne in mind that benzol plays an important part as a fuel for motor-cars and aeroplanes, and that the gas contains nine times as much as there is in the tar. Moreover, the working-up of tar by large gas-works or by conjoint tar-works needs careful consideration. The higher boiling constituents of coal tar have, in recent years, found fresh employment as lubricants; and many plants have been devised for the distillation of tar on a comparatively small scale. The working of such plants, and more especially the further working-up of tar products, is, however, dependent for successful results on values in the world's markets; and each case must be decided on its particular merits.

The most important question of the day, however, is that of the quality or calorific power of gas, which has been referred to a Special Committee of the German Association. This Committee have requested the speaker and the experimental works, in the first instance to investigate and determine what is the lowest calorific power, along with appropriate specific gravity, which gas may have without interfering with the proper behaviour of the existing appliances of consumers, and without being appreciably to their disadvantage. This question, so far as scientific study of it at present shows, may be answered by the following considerations. Coal will continue to be the predominant raw material of gas manufacture, both on account of its wide dissemination and its abundance (Germany is the richest in coal of European countries), and on account of the value of the bye-products which it yields on carbonization. Lignite, peat, wood, &c., can only have local or temporary importance, though lignite during the past winter was largely used to maintain the gas supply in one large town in South Germany. In view of the prevailing shortage in the coal supply, however, Herr Körting has advocated the dilution of coal gas with blue water gas in order to produce a mixed gas of 492 (in round figures 495) B.Th.U. gross per cubic foot. This mixed gas may be made either from coal gas and water gas produced in separate plants, or by steaming the charge in vertical retorts, &c. An insight into the effect of diluting coal gas with other gases may be obtained from the comparative composition of the gases, analyses of which are given in Table II. Coal gas, lignite gas, and water gas contain little nitrogen; while the other four gases are rich in nitrogen.

Table II.—Composition of Various Technical Gases.

—	Coal Gas.	Lignite Gas.	Water Gas.	Mond Gas.	Producer Gas from		Flue Gas.
					Coal.	Coke.	
Hydrogen . . . p.ct.	51·0	48·0	50·0	26·0	10·5	8·0	..
Heavy hydrocarbons ,,	3·8	1·0	..	..	0·1	..	..
Methane. . . . ,,	30·2	10·0	..	4·0	1·5	..	..
Carbonic oxide. . ,,	9·0	14·0	40 0	12·5	27·0	18·0	..
Carbonic acid . . ,,	2·0	22·0	4·0	15·0	3·5	11·0	20·0
Nitrogen . . . ,,	4·0	5·0	6·0	42·5	57·4	63·0	80·0
Gross calorific power B.Th.U. per c.ft. . .	570	320	288	136	84	136	..
Specific gravity . . .	·409	·620	·540	·800	·886	·956	1·077

Table II. also shows the calorific power, in round figures, and the specific gravity of each type of gas. The change in calorific power produced on coal gas by the admixture of varying proportions of the other gases is directly proportional to their ratios in the mixture. The percentages of other gases which would have to be mixed with coal gas of 570 B.Th.U., in order to reduce the calorific power (by 13·8 p.ct.) to the suggested standard of 492 B.Th.U. would be: Flue gas, 13·75; coke producer gas, 16·1; coal producer gas, 18·0; Mond gas, 19·2; water gas, 27·8; and lignite gas, 31·3—all as percentages of the mixture. The specific gravity of the 27·8 p.ct. water gas mixture is ·446, as compared with ·409 for coal gas only; and in order to obtain the same number of heat units in the same time at the burner or boiling ring with this mixture, the pressure would have to be increased by 35 p.ct. to produce the required increase in the rate of efflux. That is to say, if the normal pressure with coal gas were 12-10ths, the equivalent pressure for the 27·8 p.ct. water-gas mixture would be about 16-10ths. Similarly, the composition would be altered from that given for coal gas in the first column of Table II. to the following figures for the 27·8 p.ct. water-gas mixture: Hydrogen, 50·7 p.ct.; methane, 21·8; carbonic oxide, 17·65; heavy hydrocarbons, 2·85; carbonic acid, 2·4; nitrogen, 4·6.

After the foregoing scientific study of the question, it was still necessary to carry out practical tests to ascertain to what extent consumers' present lighting and heating burners could be forthwith used with the mixture of coal gas and water gas (27·8 p.ct.) and what results they would give with such a mixture. For this purpose, the co-operation of the German Welsbach Company and the firm of Messrs. Ehrich and Gratz (lighting engineers of Berlin) was obtained, and tests made with a mixed gas of 492 B.TH.U. gross per cubic foot, specially prepared by Herr Körting at the Gitschiner Strasse Gas-Works in Berlin.

A large number of reports on this exhaustive series of tests are in the speaker's hands; but for the time being he could only give the general result. In order to avoid trouble through lighting-back, roaring, &c., both lighting and heating burners must be provided with some simple means of controlling the primary-air supply, and preferably the gas consumption also. Such adjustable burners are already almost always in use with inverted gas lights; but they must be introduced for the upright lights also. No change is needed in the shape of the mantles commonly in use with either type of burner; but in order to obtain normal results, the pressure in the mains should be increased by from 16-10ths to 20-10ths. Simple means of controlling the primary-air supply would also be required with all gas-cookers; and it is indeed desirable that such means should be provided (where they are not already fitted) even in present conditions, with a view to entirely disposing of the numerous complaints of the defective quality of the gas supplied.

As to economy, the existing burners have for the most part been designed for coal gas of about 545 B.Th.U. gross, and when used with gas of 492 B.Th.U. show a diminution in the result produced of about 10 p.ct. It appears not unlikely, however, that improvement in the burners may increase the economy of the results obtainable with the lower grade gas. With boiling burners the gas consumption is similarly reduced with the fall in calorific power. With industrial heating appliances practical tests of the effect of reducing the calorific power have not yet been made; but it may be assumed that with apparatus intended for relatively low temperatures the same conditions will obtain as with boiling and grilling burners. On the other hand, with special high temperature apparatus the addition of water gas to coal gas is unlikely to cause any serious disadvantage, because water gas has already been extensively employed for welding and similar purposes, and is specially suited for them.

The speaker's deliberations, and the tests made, indicate that an addition of water gas to coal gas sufficient to reduce the calorific power to 492 B.Th.U. gross per cubic foot may be carried out, having regard to both the chemical standpoint and the requirements of the consumer.

Professor Bunte then brought forward, with the approval of the Council of the Association, the following three resolutions:

1.—The annual meeting requests the experimental works to continue to make tests of average samples of the coal supplied to German gas-works.

2.—The annual meeting requests the Council to take steps to assess the value of gas coals, having regard to their quality, price, and fitness for gas manufacture.

3.—The Council, in collaboration with the experimental works, should investigate further the question of increasing the make of gas from gas coal, and, having regard to the extraordinary increase in the price of the raw material, bring forward proposals which will effect economy both for the gas-works and the consumer.

(To be continued.)

Particulars are given in the "Bulletin des Usines de Guerre" of an optical pyrometer in use for controlling the temperature of gas-furnaces. Two squares of coloured glass are illuminated by transmitted light from an electric lamp; the tints of the glass being so chosen as to correspond to the colour of the furnaces at the maximum and minimum permissible temperatures. Pyrometers of this description are also said to be in use in connection with the hardening of tools.

WATER-GAS MAKING WITH BITUMINOUS COALS.

To demonstrate the possibility of using low-sulphur bituminous coals from Illinois, Indiana, and Western Kentucky in the manufacture of coal and water gas, experiments are being carried out by the State Geological Survey, in co-operation with the United States Bureau of Mines and the Illinois State University; and a series of "Progress Bulletins" relating to the investigation are being issued. One of these was noticed in the "JOURNAL" a few weeks ago [*ante*, p. 355]; and since then another—Bulletin No. 22, on "Water-Gas Manufacture with Central District Bituminous Coals as Generator Fuel," has come to hand.

The authors are Mr. W. W. Odell, of the United States Bureau of Mines, and Mr. W. A. Dunkley, of the State Geological Survey Division; and they give data on present water-gas manufacture gathered by them during an inspection of twenty plants in Illinois and surrounding States in which bituminous coal from the district referred to is being used. Last winter, the shortage of coke fuel at many water-gas plants led to some independent experimentation with bituminous coal of various sizes from districts in Illinois and Indiana where low-sulphur coal is mined; and as a rule, the results have been encouraging. The plants have been kept going; and under certain conditions central district coal as generator fuel has proved more economical than coke. The report outlines the difficulties which were anticipated, and those actually met and overcome in connection with the change of fuel, and furnishes operating data from several plants. The inspection reveals that there are still many operating problems to be solved; and that a further study of these will be of benefit to the gas industry. Consequently, the present bulletin is only preliminary to the publication of the results of further investigations which are being undertaken. The authors name the following problems as all requiring experimental study: Determination of the best operating cycle under the varying conditions; increasing the capacity of the water gas machine; reducing the required amount of generator fuel and of oil; eliminating the smoke trouble; reducing the quantity of carbon in the ash and clinker; results obtainable with various kinds and sizes of central district coal.

It seems that the average figures at the twenty plants visited showed a decreased capacity of the set of about 25 p.ct. when using coal in place of coke, and an increase of about 30 p.ct. in the amount of fuel needed for making 1000 c.ft. of gas. However, the cost of coal being less than that of coke, and the amount of oil necessary being decreased about 10 p.ct., the actual cost of gas per 1000 c.ft. decreased when coal was used.

METHODS OF OVERCOMING OBJECTIONS.

As to methods of overcoming objections, the authors say that when the central district coals are charged into a water-gas generator in the same volume as coke would be charged, a rather dense firm mat of coke is formed on blasting. The mat arches over the top, and does not drop from the charging-door without being poked. This property of matting when heavy charges are used naturally increases the tendency to form flues or chimneys in the fuel itself, and reduces the capacity and operating efficiency of the machine. To overcome this caking difficulty, coal must be charged into the generator in much smaller quantities by volume than coke, since coal is heavier per unit of volume. Some operators—particularly those handling the larger sets—carry a deeper fuel-bed than they would otherwise consider possible, by making "split" steam runs. That is, they reverse the direction of flow of steam through the fire while the run is in progress.

At a few plants some trouble has been experienced from smoke, especially where the plant is located in a residential district. It is very difficult to avoid smoke or oil fumes at all times, even with coke fuel. With coal, the trouble is much increased, because it is specially difficult to completely burn the hydrocarbons given off from the incomplete combustion of coal in the machine during the early stages of the heating-up period, when the checker-bricks in the carburettor are not hot enough to ignite these gases. Where a set is operated to almost its full capacity, these bricks will not usually cool off so much during lay-over periods that any great difficulty will be found in quickly igniting the generator gases; but in a plant operating only a few hours a day, the problem is greater. One ingenious operator has hastened the ignition by means of an automobile spark-plug screwed into a short length of pipe extending above the carburettor. With this device, he his able to ignite the gases passing into the carburettor long before the bricks would become hot enough to ignite them. At the same time, the heating-up of the carburettor and superheater is hastened. In order to reduce the smoke formed after coaling the machine, some operators blast before coaling, and make a steam run before blasting again.

The prevention of the overheating of the carburettor and superheater during the blasting period lies in the proper timing of this operation. It is generally accepted that, on blasting coal containing a high percentage of volatile matter, a gas will be produced containing some of the hydrocarbons of the volatile matter of the coal. Such blast gases are higher in heating value than the blast gases from coke, and when burned in the machine they produce more heat in the carburettor and superheater. Therefore, a long blast on such a fuel as central district bituminous coal will result in the production of more heat than is required for cracking and fixing the carburetting oil. This means that the gas in excess of the amount required for the proper heating of the checker-brick has to be burned at the stack. Not only is this a wasteful process, but it so heats the stack that there is danger of melting it. Therefore prolonged blasting such as is sometimes practised with coke is undesirable if bituminous coal is used as generator fuel.

More tar is formed with coal as generator fuel than with coke; the average increase noted being 25 p.ct. Under some conditions it causes the valves—and particularly the hot valve—to stick or work less freely. While this excess of tar need not cause any serious trouble, most operators take some precautionary measures. Sometimes distillate or paraffin oil is poured down the stem of the hot valve to soften the tar after completing the day's run. The tar trouble may also be diminished by tapping a hole in the valve-bonnet, and pouring into the valve once a day through this opening a little lubricating oil.

Actual practice indicates that the coals from Southern Illinois and from Indiana containing less than 1½ p.ct. of sulphur have not caused any sulphur trouble when used in the manufacture of water gas. One company reports that the unpurified gas from these coals contains only 5 p.ct. more sulphur than the water gas manufactured from coke, using the same kind of oil in both cases. Some operators state that the gas manufactured with bituminous coal purifies more easily than that produced when using coke fuel. Serious sulphur trouble has not been noticed in any of the gas plants visited.

From the experience of various operators with Central District coals, it seems that the fear of an excessive deposit of carbon in the checker-bricks resulting from the use of coal is largely groundless. At only one of the plants visited was any abnormal deposition of carbon reported. In this case, a loose deposit of carbon in the shape of an inverted cone was said to form in the interstices of the superheater checker-bricks; the apex of the cone being near the bottom of the checker-work, and the base of the cone near the top, where it extended to within a foot of the wall. The set was 8 ft. 6 in. diameter, and was operated for 24 hours a day. A sample of the carbon analyzed carried over 98 p.ct. combustible matter, showing that it was deposited carbon, and not coal dust. In operating this machine, some of the blast gas was burned outside the machine at the stack. The operating cycle consisted of a three-minute blast and a four-minute steam run; and the blast pressure was 16 in. The steam used was 40 to 45 lbs. per minute; and alternate up and down runs were made.

In those Illinois gas plants where good results with coal are being obtained, without the formation of carbon, the method of operation is to employ a greater blast pressure, a shorter time of blast, and a greater amount of steam per minute during the runs than is used when coke is the generator fuel. By using what appears to be an excessive amount of steam, the temperatures of the carburettor and superheater are reduced to such an extent that the gas produced in the subsequent blast can be entirely burned within the machine, without overheating. With this practice, no carbon troubles are experienced in the superheater.

The fusing-point of the ash of central-west coal is lower than that from eastern coke; and therefore, to avoid clinker, which is simply ash fused or melted together, it is necessary to avoid unduly high temperatures. For this reason, if the fuel-bed is not blasted too long, and the air pressure is not too high, little clinker trouble need result. There is a tendency among operators to use relatively more steam with coal than with coke, which practice, together with the blasting method employed, usually results in a clinker which is more easily broken up than that from coke.

WATER-GAS MANUFACTURE AT PLANTS USING BITUMINOUS COAL FUEL.

As a result of the inspection of water-gas plants using bituminous coal, it is possible to discuss the principal points in operating practice which seem essential to success. The following variables seem to be most important: Kind and size of fuel; depth of fuel bed, and its relation to blast and steam cycle; quality and quantity of oil used; distribution of oil in the carburettor; temperature maintained in the carburettor and in the superheater; and purging the machine with air. Each of these variables has so important a bearing upon the operating results, and all are so inter-related, that a change in one condition almost invariably necessitates a change in others if the heat-balance in the machine necessary to good operation is to be maintained. It is not possible to predict exactly what combination of conditions will be necessary in each case.

Kind and Size of Fuel.—The smaller plants use lump coal about 5 in. diameter. In the larger plants, it is the practice to use egg-size coal or lumps between 2 and 6 in. diameter, charged into the generator without preliminary breaking.

Depth of Fuel Bed, and its Relation to Blast and Steam Cycle.—The depth of the fuel bed maintained in the generator, and the blast and steam pressure carried during operation, are so closely inter-related that they may well be discussed together. The effect of a thin fuel bed in reducing the tendency of the fuel to mat together has already been discussed. Most operators find that the fuel can best be maintained at the desired depth by coaling the generator more frequently, and with a smaller weight of charge, than when using coke. Several operators state that the weight of the coal charge should be about 80 p.ct. of the weight of the coke charge, and that one or two fewer runs should elapse between charging times. A decreased depth of fuel bed permits the passage of more air or steam through the fire in a given time at a

given pressure. With bituminous coal, most operators not only blast at about 2 or 3 in. water pressure less than when using coke, but also decrease the length of the blasting period. In the majority of plants visited the steam was not decreased in the same proportion as was the air blast; and the length of run was usually the same as with coke. A very common cycle was a two-minute blast followed by a four-minute steam run. A three-minute blast followed by a five-minute run was also frequently observed. In the matter of proportioning the "up" and "down" runs, there was a great difference of opinion. Some operators alternated the up and down runs after the set had been brought to normal running conditions. Others made more down runs than up runs; while still others favoured more up runs. A few preferred to "split" every run. It was quite common practice in the plants inspected to use about 10 lbs. more of steam per minute on the down runs than on the up runs.

Quality and Quantity of Oil Used.—The quality of oil used in a given plant will, of course, affect the operation, and have a part in determining the proper cycle. The consensus of opinion seems to be that oils from different fields require different heat treatment; and so it is impossible to prescribe operating conditions without taking the kind of oil into account. However, assuming that a change is made from coke to coal fuel, there are certain differences to be observed in operation. The so-called blue gas produced from bituminous coal fuel is higher in heating value than the blue gas from coke, since it contains a considerable percentage of hydrocarbons. Consequently, less oil is required per 1000 c.ft. of gas to enrich it to the required standard. The reduced amount of oil may be as much as 0·5 gallon per 1000 c.ft. of gas. Since the amount of gas made per run is usually less with coal than with coke, the amount of oil required per run is less. To fix the oil, the same temperatures are usually maintained in the carburettor and superheater as when using coke fuel. These temperatures range from 1250° to 1350° Fahr.

Distribution of Oil in the Carburettor.—In changing to coal fuel, the oil spray in the carburettor is often left as it was when coke was used. The result is that, with a decreasing oil requirement per run, it is necessary to reduce the rate of oil flow through the nozzle; and frequently this reduction results in poor distribution. Instead of spraying uniformly over the surface of the bricks in the top of the carburettor, much of the oil may pass down through the centre of the carburettor, resulting in incomplete vaporization and low oil efficiency. As a consequence, a large portion of the oil is wasted. Furthermore, the concentration of the oil in the centre of the carburettor will often cause an excessive deposit of carbon, which fouls the checker-bricks, and soon necessitates re-checkering.

Purging the Machine with Air.—In some plants it is the practice to purge the machine with air after completing the steam run, and before raising the stack-valve. There is evidently a gain by doing this, though often it is carried so far that the dilution of the gas by the lean air gas thus manufactured makes necessary the use of an excessive amount of oil to bring the gas to the required B.Th.U. standard. By watching the quality of the gas, the operator can estimate how far he can carry this purging process. One advantage not usually considered is that during this purging carbon is being burned in the generator, thus causing a rise of temperature in the fuel bed; and, at the same time, the carburettor and superheater are being heated less than during the regular blast period, when blast gas is being burned in these chambers. Since the usual tendency in operation is to allow the superheater to become too hot, this process of purging may give the operator greater control over the temperature. As a precautionary measure, before opening the air blast to purge, the operator should make sure that the blower is up to speed, so that there will be sufficient pressure in the air-lines to prevent any back-firing in the blast-line.

MANUFACTURING COSTS.

After giving, and discussing, a table showing the practice at four water-gas works, and dealing at some length with the financial aspects of the matter, the authors, using values laid down by them, tabulate the following comparisons.

Comparison of the Approximate Manufacturing Costs of Water Gas with Coke and with Coal as the Generator Fuel.

	Cost per 1000 C.Ft. of Gas Made.	
	Coke Fuel.	Coal Fuel.
Generator fuel	$0·150	$0·090
Oil	·227	·203
Steam (fuel and labour, &c.)	·050	·071
Gas-making labour (including fuel handling)	·012	·017
Purification expense	·008	·009
Total	$0·447	$0·390
Credit from sale of tar	·007	·009
Net	$0·440	$0·381

Saving by the use of coal as generator fuel, $0·059 per 1000 c.ft. of gas made.

The table does not take into account all the elements of cost, but only those which would seem to be affected by the kind of generator fuel used; it being assumed that the same amount of gas is produced per day in each case. Therefore the figures are not presented to show the actual cost of gas into the holder, but only to indicate the approximate saving in manufacturing cost which might be effected under the conditions assumed. The actual saving will vary. Some plants report considerably higher savings, while others are not doing so well.

CONCLUSIONS.

Inspection of the plants leads to the following conclusions regarding the use of central district coal as compared with coke for generator fuel.

1.—Central district coals are successfully used in the manufacture of water gas.

2.—Under present operating conditions, a decrease in producing capacity of from 20 to 35 p.ct. may be anticipated from the use of coal as compared with good coke.

3.—Clinker troubles are not usually as serious as with coke fuel.

4.—There are no serious sulphur troubles when selected low-sulphur coals are used.

5.—Gas made with central district coal as generator fuel costs less per 1000 c.ft. under present conditions than does gas with coke generator fuel. Though more fuel is used per 1000 c.ft. of gas, this is offset by the lower price of the fuel, the decrease in the amount of oil required, and the increase in the amount of tar for sale.

Paying for Gas-Mains.

In a paper which he read before the Michigan Gas Association, Mr. W. S. Blauvelt said that, when gas-mains are laid, three parties expect to receive a benefit—the gas company (who pay the bills), the population to be served (present and prospective), and the people who own the land adjacent to the mains. The gas companies may or may not secure an adequate return for their money, depending often upon conditions beyond their control. The population served will get the benefit of gas service for which it may be presumed that generally they pay at least a reasonable price. But whether the gas company make money or not, whether the householder is satisfied or dissatisfied with his gas bill, land values adjacent to the new gas-main are enhanced thereby to an extent greatly exceeding the cost of the main. The purchaser of a piece of ground pays to the landlord the value of the plot without the gas service, *plus* the cost of the main, and *plus* a handsome profit. He builds a house, and buys gas—paying the bill, a large share of which is made up of the capital charges and the taxes on the gas-mains. In fact, the consumer has paid for excessively watered capital on the gas-main in the price of his plot; and now he has to pay capital charges again to the gas company. The gas company must have the money, for they have honestly made the investment in the gas-main, even though the landowner has realized on it with a handsome profit. Obviously, someone gets something for nothing; and when this occurs, someone else must get less than he should. Under normal conditions, the gas company obtained what rightfully was their own—the cost of the service, a reasonable return on the investment, and a fair profit. But the consumer lost, at the expense of the landowner. Now we have come to conditions where possibly the consumer may be getting his gas for a fair price—considering his other payment to the landlord—but the gas company are being robbed. However, the author says the difficulty has been solved in other directions, and is by no means impossible to overcome by the gas business. Why should not gas-mains be paid for exactly as sewers and pavements, by a tax on the land, the value of which is increased by their presence? Why should not their maintenance be paid for similarly, by a tax on land values, from which rents are higher because of the gas-service? The public pay for the highway used by the coal-dealer; but the vendor of gas is compelled to pay for his highway, and to keep it in repair; and then he has to pay a heavy tax thereon.

Mineral Resources of Great Britain.—The Board of Agriculture and Fisheries intimate the publication of the Seventh Volume of the Special Reports on the Mineral Resources of Great Britain (Lignites, Jets, Kimmeridge Oil Shale, Mineral Oil, Cannel Coals, Natural Gas), which have been prepared by the Director of the Geological Survey in response to numerous inquiries that have arisen through the conditions brought about by the war. This volume deals with the lignites of Bovey Tracey, the explorations which have been made in them by Germans and others, and the uses to which they have been put. Other less important examples of lignite are enumerated; and an account is given of the uses and working of jet, while the distribution and qualities of Kimmeridge oil shale throughout the country are described in detail. The principal known occurrences of mineral oil are also dealt with. The existence of cannel coal, under its various names, is recorded for many coalfields; and an account is given of the presence of natural gas in various formations, apart from coal measures, in England and Wales.

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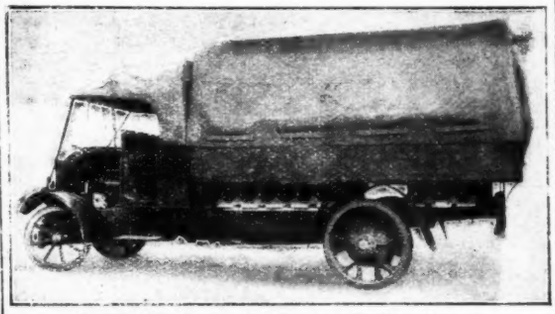

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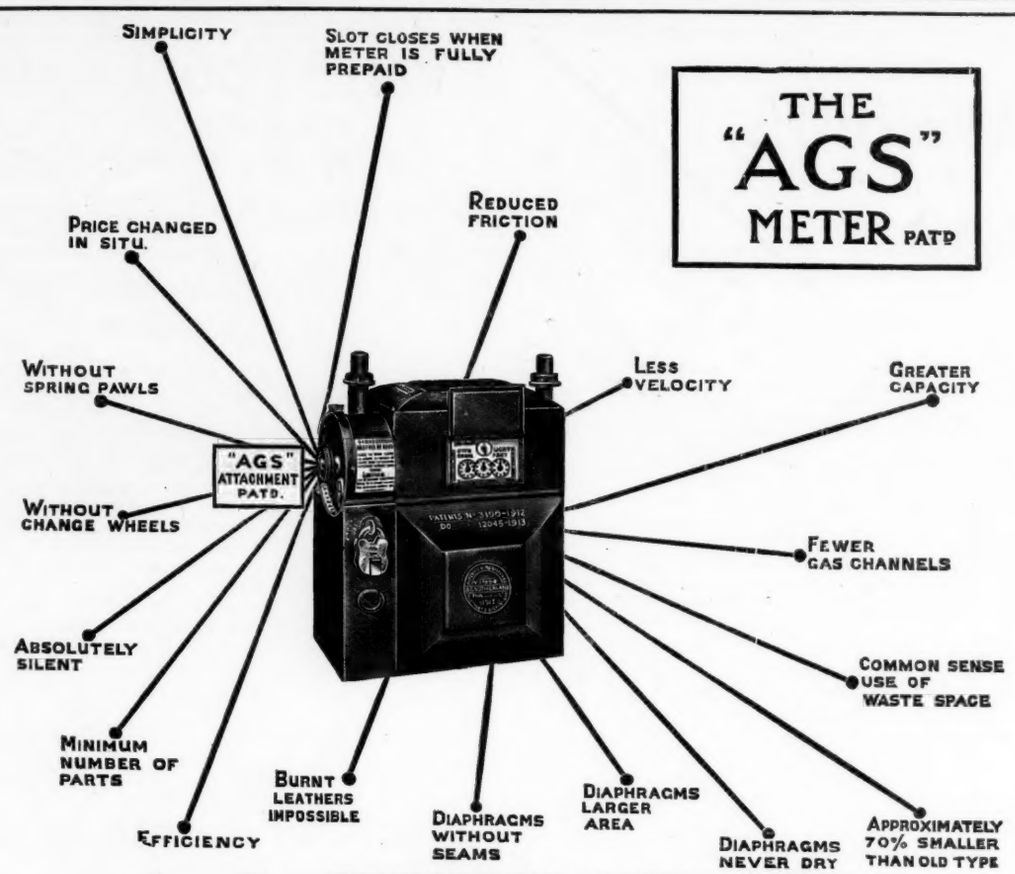

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OXIDE USED IN GAS PURIFICATION.

Papers read at Newcastle.

At the November Meeting of the Newcastle Section of the Society of Chemical Industry, two papers were read on subjects relating to the use of oxide in gas purification. They were entitled "Note on the Estimation of Sulphur in Spent Oxide," by Mr. W. Diamond, the Manager of the Marley Hill coke-ovens and bye-product plant of Messrs. John Bowes and Partners, Ltd.; and "Notes on the Activity of Iron Oxide in Gas Purification," by Mr. G. Weyman, the Chief Chemist to the Newcastle and Gateshead Gas Company.

SULPHUR IN SPENT OXIDE.

After sketching the process of oxide purification and revivification, Mr. Diamond went on to say that, in addition to sulphur, other matters were abstracted in the course of purifying—such as cynanogen, tar, oil, and ammonia, all of which were serious impurities to the acid maker, by greatly increasing the proportion of nitre required for the conversion, and by reducing the cubical area within the chambers for the chemical reaction. Of course, the value of oxide could be estimated before purchasing, and allowance made for the content of impurities; but he himself was more concerned in being able to state to the charge-man, as accurately as possible, how much sulphur he had to work with, and how much sulphuric acid he ought to turn out from it. The trouble was that the sulphur in spent oxide was estimated by extraction from carbon disulphide. If the CS_2 extracted only the sulphur, it would be all right; but the impurities named also were extracted, and were finally all weighed and termed "sulphur." An equally indefinite result was given by estimating the tar content by what was termed the sulphuric acid test. According to Mendaleef, sulphur was soluble in CS_2, in practically all proportions, but was only slightly soluble in pure benzene when cold. It occurred to him (the author) that, by washing dry spent oxide with several portions of benzene, all the tar and oil would be extracted, leaving the sulphur commercially pure. He explained how he had done this; adding that, while the method was not the acme of perfection, it was considerably better than either the carbon disulphide or acid treatment.

ACTIVITY OF OXIDE IN GAS PURIFICATION.

In his paper, Mr. Weyman stated that the sulphides of iron with which such purification was concerned were (*a*) Fe_2S_3, which oxidized atmospherically to free sulphur and ferric oxide; (*b*) FeS, which also oxidized to free sulphur and ferric oxide, but at higher temperatures might combine with free sulphur to form (*c*) FeS_2. It seemed somewhat uncertain whether the disulphide, when prepared in this way, would further oxidize in air to give ferrous sulphate. Ferrous sulphate, however, was always present in the unoxidized sulphides, though at low temperatures the amount might be small; but after oxidation, the amount was certainly increased. Purification of coal gas was made at temperatures somewhat above the normal, under which condition Fe_2S_3 was the chief product. Mr. Lewis T. Wright found that, by acting on the hydroxide precipitated by ammonia from ferric chloride with hydrogen sulphide, and treating the product with CS_2 out of contact with the air, he obtained a variable of free sulphur which bore no relation to the total quantity of free sulphur obtained after oxidation. Free sulphur was always present from one source or another; and disulphide was produced by local heating. Subsequent oxidation might account for part of the ferrous sulphate found. This reaction also resulted in the liberation of sulphur dioxide.

In those cases in which there was no excess of alkali present, the oxide quickly became acid, and the activity fell off with remarkable abruptness. If the oxide were maintained in an alkaline condition, the ferrous sulphate formed was immediately decomposed, with the result that the full amount of ferric hydroxide was liberated and available for further use. Even in an alkaline condition, the activity of the oxide fell off in course of time. In an acid condition, the amount of iron rendered inert by the formation of ferric and ferrous salts, or as the disulphide, was not sufficient to account for the almost complete inactivity of the whole body of the oxide. Gedel had pointed out the remarkable influence of traces of ammonia or acid on the absorption of hydrogen sulphide by oxide of iron, and had found that in the latter case the monosulphide, and, later, the disulphide were formed; while in the former case only the sesquisulphide resulted. He could not find any monosulphide in ordinary works oxide—a fact he put down to the presence of ammonia. Though Lewis Thomson, in his "Chemistry of Gas Lighting," stated that the activity depended upon molecular structure rather than upon hydration, it was generally considered that only hydrated oxide was active, probably owing to the fact that strongly ignited oxide was certainly inactive. From experiments, it was evident that ferric hydrates, dehydrated at as high a temperature as 650° C., might still retain their activity in the cold. At about 700° C., a change set in, which might also be effected at lower temperatures by very prolonged heating.

Under certain conditions, and with particular varieties of oxide, the absorption of hydrogen sulphide might take place in the comparative absence of water. In all cases except one, the oxide obtained after heating to from 100° to 650° C. gave, in the cold, practically theoretical absorption, calculating on the content of ferric oxide. Oxide heated to 700° C. only gave a partial absorption, the extent of which noticeably depended upon the time of heating, and ranged from 10 to 32 p.ct. of the hydrogen sulphide. Oxide heated to 800° C. absorbed less than 1 p.ct. In the exception referred to, the hydrate dealt with was obtained by precipitation or a fresh solution of ferric chloride by ammonia, and drying at 100° C. When dried at this temperature, it gave the maximum activity; but when heated to 280° C., just after losing the bulk of the water, it became incandescent, and left, on cooling, a black, lustrous, hard residue, which was inactive. In all cases, most, at any rate, of the water of hydration was given off before 300° C. Even the oxide, heated to 800° C., which was inactive in the cold, absorbed the gas with avidity at the higher temperature. This indicated that the change in structure which prohibited the action of hydrogen sulphide in the cold must take place on cooling, and that at 800° C. the oxide molecules were in such a mobile state that slow cooling gave them the opportunity of arranging themselves in a more condensed state.

To obtain further evidence of this, some oxide was heated for three hours to 800° C., and all but a check portion was plunged suddenly into cold water. On determining the absorptive power towards hydrogen sulphide in the cold, the check sample, which was cooled slowly, absorbed less than 1 p.ct. of the hydrogen sulphide; while the quickly cooled portion gave, after drying, 43 p.ct. With a better cooling arrangement, it would seem probable that the absorption would be more nearly theoretical.

"Burnt oxide" from the manufacture of sulphuric acid was in a similar condition to the oxide heated above 700° C. It had been used, and was used, for gas purification, not on account of the ferric oxide, but by reason of the varying amount of ferrous sulphate it contained, which was converted into ferric hydrate by the addition of an alkali and subsequent oxidation before use. Unfortunately, the burning of the material was often carried to such a point that little or no ferrous sulphate was left; and the material was quite worthless from this point of view. It was true, also, that the amount of ferrous sulphate necessary to make it of value was relatively small, because, with revivification *in situ*, which was now universally the practice, the same oxide might be alternately fouled and oxidized many more times than used to be commercially feasible. The foregoing considerations led to the idea that the chemical activity of oxide of iron was dependent primarily on molecular structure, and not upon any particular amount of hydration. At the same time, the molecular structure was evidently derived in almost all cases from some form of hydrate.

The author proceeded to discuss in detail the conclusions arrived at by former investigators with reference to the constitution of ferric hydrates, with a view to showing that these admitted of a very close application, and found some confirmation in the study of gas purification. He said that, in further study, it was evident that precautions should be taken to ascertain the type and degree of polymerization of the oxide used. The hydrate produced by oxidation of ferric sulphide was not of the crimson, reddish-brown, or dark-brown varieties thrown from solutions of ferric salts by alkalies, which as a rule became incandescent at about 280° C., and afterwards gave a black, inactive, crystalline mass, but was a yellow or light-brown body similar to that formed by atmospheric oxidation of the hydrates thrown down from solutions of ferrous salts by means of alkalies. It was fully as active as the red varieties. Consideration of the formation of the natural ores used in gas purification—yellow ochre, bog iron ore, &c.—would show that these had been formed in a similar manner by precipitation under reducing conditions and subsequent oxidation. Further, the red hydrates, after the first fouling and oxidation, gave a similar brownish-yellow type. This transformation seemed to be accompanied by liberation of heat, which was added on to the heat of reaction. This meant that the absorption was more rapid; but the amount of hydrogen sulphide absorbed was the same in the end. It was evident, therefore, that gas purification was concerned with these yellow-brown types of hydrates; and it seemed to him that further study on these lines would reveal important practical and theoretical results.

DISCUSSION.

In the course of the discussion which followed the reading of the papers,

Mr. T. HARDIE said there was no doubt the old method of simply washing spent oxide with carbon disulphide did give advantage to the sellers. The buyers were entitled to a new method; and the one proposed by Mr. Diamond would meet the case. Probably, there would be a larger payment per unit, since the number of units sold would be less. The purification of gas by oxide of iron had proved to be a much more complex subject than was originally thought.

Dr. J. T. DUNN expressed the opinion that Mr. Diamond was on the right lines. From figures he (the speaker) had arrived at, it would seem that if one were to extract with CS_2, and then assume the total sulphur to be 95 p.ct. of this extract, in nearly all cases it would be very near the truth. It would, however, be more satisfactory to have a method of extracting the pure sulphur directly.

Mr. C. DRU DRURY said he was aware that there were considerable chemical changes going on in connection with oxide purification; but he had no idea they were involved in such complexities as had been revealed.

Mr. F. H. WALKER said he had found that, after extracting by CS_2, there was quite a considerable amount of SO_2 given off from the residue on roasting. Mr. Weyman's paper indicated the importance of keeping the purifying material in the boxes alkaline.

Mr. A. TROUBRIDGE remarked that he had carried out experiments

on the estimation of sulphur by combustion, and found that this method gave him results which were, on the average, 4 p.ct. lower than the CS_2 method. It did not matter to the manufacturer how much sulphur there was in the oxide, if he could not get it out.

The CHAIRMAN (Dr. P. Phillips Bedson), alluding to the estimation of sulphur in spent oxide, said that the combustion method appeared preferable.

VERTICAL RETORTS AT ROCHESTER (N.Y.).

In addition to the fact that it is one of the most modern installations in America, the extensive new gas-manufacturing plant at Rochester (N.Y.), which was put into operation earlier this year, possesses the advantage that it is situated in approximately the geographical centre of the city—a fact which, while rendering necessary the complete elimination of nuisance from smoke, &c., greatly simplifies the distribution of gas and coke. The outlay involved has been $1,500,000; and the contract for the manufacturing plant was given to the United Gas Improvement Company, who put in an installation on their system of intermittent vertical retorts having a carbonizing capacity of 400 tons of coal per 24 hours and yielding 4,000,000 c.ft. of gas, 2400 lbs. of ammonia, 280 tons of coke, and 5600 gallons of coal tar.

There are three batteries, each containing seven benches of nine retorts. In an illustrated description of the works which has appeared in the "Gas Record," of Chicago, it is stated that the retorts are 10 in. by 22 in. at the top, 18 in. by 30 in. at the bottom, and 22 ft. 2½ in. high, with a capacity of 2200 lbs. of coal per charge, which is carbonized in eleven hours. Venturi meters are provided for measuring the quantity of hot producer gas supplied to the settings, and also for measuring the secondary air. Provision is made for the control of temperature at any point by means of delaying combustion, dividing secondary air, &c., in the combustion and retort chambers. The plant can be operated on a schedule charge without variation of heats in any of the benches. The only adjustment required is in the quantity of producer gas and secondary air passing through the settings. The quality of the producer gas is regulated by the amount of steam used with the blast; and the required temperature in the benches is maintained by the quality of the producer gas. Each bench is provided with a 3-ft. hydraulic main, and under each bench is an auxiliary main—both being equipped with adjustable weir-valves. The lower hydraulic main is for gas coming off from the bottom of the retorts.

Bunkers running the whole length of the retort-house carry a two-days' supply of coal; and electrically propelled buggys, after automatically weighing the coal, discharge it into the retorts by gravity. Three retorts are charged and discharged at one time. The buggy is equipped with a device which closes the lids when it is moved away from the retorts—thus allowing the operator to fix the lids without being exposed to flame or smoke. For dealing with the smoke during charging, the buggy is enclosed in such a way as to guide the smoke directly to a chamber above the coal-bunkers, from which it is drawn through a 48-in. ventilating flue. An electrically-driven car receives the hot coke as it is discharged from the retorts, carrying it to the end of the house, where it is quenched, and then dumped on to the coke-wharf. The lower ends of the retorts are closed absolutely tight by special means devised by the contractors; and an air-blast after each charge is utilized to blow-off the dust, &c. The ventilation of the retort-house is one of its features. A system of ducts removes the smoke and fumes from the building; two motor-driven Sturtevant ventilating fans being provided, which discharge into a 275-ft. chimney-stack. The natural draught from this high stack is frequently sufficient to ventilate the house without using the fans.

The producers for firing the retorts are of a modified Kerpely type, operating continuously. There were five producers installed, though it has been found necessary to use only three to operate the plant at full capacity. Two Sturtevant blowers driven by Terry steam-turbines provide primary air to the producers; while the exhaust from the turbines supplies the steam required. Steam and air are continuously admitted to the producers. Coke is at intervals fed into the producers from overhead bunkers; and after each charge, a device on top of the producers is rotated by hand to distribute the fuel uniformly. The gas leaves the producers at a temperature of 1100° Fahr.; and the total drop in temperature between the producer outlet and the benches is only 100° The gas passes through a dust-trap at each of the producer outlets, and is then carried through an internally lagged steel flue to a cyclone dust arrester, which removes the smaller particles. This arrangement adds considerably to the life of the settings.

As already stated, the plant was designed for a capacity of 4,000,000 c.ft. of gas per 24 hours; but it is producing approximately 4,500,000 c.ft. Very little labour is required; recent figures showing a yield of 240,817 c.ft. of gas per man per day. The plant is operated on three shifts of eight hours each; two men being required for the plant, and seven for the retort-house. The following figures are given of the operating results for August, in addition to the make per man just quoted: Coal carbonized, 12,412 tons; gas made, 134,376,000 c.ft.; yield per pound of coal, 5·41 c.ft.; average weight of charge per retort, 2183 lbs.; average B.Th.U., 577; yield per retort per day, 22,935 c.ft.; coke yield, 70 p.ct. of coal carbonized; tar, 14 gallons per ton. After more than six months' work, the plant has in every respect met fully the expectations of the Rochester Railway and Light Company.

CALORIFIC POWER AND FLAT-FLAME BURNERS.

American Illuminating Engineering Society's Progress Report.

In a lengthy review of recorded information regarding sources of light, the lighting industry, and other factors germane to their interests, the Progress Committee of the American Illuminating Engineering Society make the following references to calorific power and the disappearing open flame.

In England, the birthplace of the open-flame gas-burner, the use of it has diminished to such an extent that of gas manufactured "not 5 p.ct. of the whole output is now used for direct illumination" in such burners, according to a statement by a member of the gas engineering profession in a Presidential Address before the Institution of Civil Engineers. It has been pointed out that a lowering of the B.Th.U. requirements for gas, in order to permit of greater toluol recovery, will have a very deleterious effect on gas lighting by open-flame burners. Particularly is this true in New England, where the Massachusetts standard, which is fixed at 528 B.Th.U., is claimed to be the lowest thus far specified for any State. It has been estimated that in this part of the country there are two or more open-flame burners for every one of the mantle type.

After a careful study of the tests made by the Inspection Department, the Gas Commission of Massachusetts have tentatively decided to adopt the French standard—viz., 528 B.Th.U—as the calorific standard for gas in Massachusetts. Previous to issuing the order, tests were conducted for six months on nineteen gas plants. The question of a universal adoption of 528 B.Th.U. as the standard for gas throughout the country has been raised by the United States Fuel Administration. It is pointed out that this would mean the doom of the old open-flame burner, as with the elimination of the candle-power requirements such a standard is ideal for incandescent gas lighting. The purpose of such an order would be to conserve oil. An agitation for a universal calorific standard and the abolition of the candle-power standard is also being carried on in England.

At the request of the United States Ordnance Department, the 600 B.Th.U. required average in several New Jersey cities was lowered to 570 B.Th.U.; it being understood that the permit would be maintained as long as the Government find it necessary in order to obtain a sufficient supply of toluol. Similarly, at the request of the Federal Government, gas companies in the First District of the New York Public Service Commission may elect to operate under a heating standard for the duration of the war and three months thereafter. An interesting fact has been brought out that in New York City only 20 p.ct. of the gas consumed is used for open-flame lighting purposes. At Minneapolis, the Council agreed to a reduction in the candle-power standard from 15 to 10; but no reduction was made in the heating standard. This action is to last as long as the Company are manufacturing toluol for the Government.

A new gas-burner introduces directly to the inner surface of the inner cone of the bunsen flame a secondary supply of heated air, independent of that which forms the mixture in the tube. It is claimed that a more perfect gas and air mixture is obtained. The use of large gas-lamps containing as many as fifteen mantles is increasing.

Coal in Spitzbergen.

Considerable attention has lately been drawn both in this country and in Norway to the coal deposits of Spitzbergen. Earlier this year, an expedition was fitted out by the Northern Exploration Company, Ltd., to proceed to the island (under the protection of the British Flag), for the purpose of securing and further extending the Company's claims, and of making preparations on a considerable scale for the getting of coal and iron in the spring of next year. The objects were fully accomplished; and Mr. B. Mangham (who has spent eight consecutive years in the country as General Manager and Engineer to the Arctic Coal Company) was left in charge of the mining operations. It is stated by the Norwegian mining journal "Bergverksnyt" that the iron-ore deposits belonging to the Company are the largest and richest in Europe; while the exposed coal deposits can be traced alongside the mountain sides for a distance of over 30 miles, on both sides of Lowe Sound, which has a width of 5½ miles. The Company have already commenced working their first mine. The expedition, which was under the leadership of Mr. F. W. Salisbury Jones, also visited the Company's other iron and coal deposits in King's Bay, Recherche Bay, Van Kuelen's Bay, and on both sides of Bell Sound, as well as properties belonging to Norwegian and Swedish Companies. These latter are said to be already doing excellent business; and their plant is being extended with great haste. Shipping to the extent of more than 120,000 tons has been engaged during this year in bringing coal to Norway and Russia. As a matter of fact, the production of coal during the present year exceeds 80,000 tons; and it is anticipated that it will next year exceed 100,000 tons.

During last and this month, the Labour Co-Partnership Association are having a series of five conferences and discussions, at Kingsway Hall, on certain experiments in profit-sharing and co-partnership; each being explained by some one intimately connected with it. The speaker to-morrow is to be Mr. Charles Carpenter, D.Sc.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Demobilization Committee's Appeal.

SIR,—The coming demobilization of His Majesty's Forces will liberate numbers of men connected with the gas industry who have no certain position to which to return. Such men will necessarily become applicants for vacancies of all kinds as they arise. The Demobilization Committee of the Institution of Gas Engineers will esteem it a favour if you will give the greatest publicity possible to the fact that they consider such men, other qualifications being equal, should receive the first, and even special, consideration at the hands of those making such appointments.

To this end the Committee ask you to be generous enough to place the following paragraph at the head of your column of advertisements for situations vacant until such time as you deem the necessity to have ceased:

> When filling vacancies, please remember the claim of the ex-service man who, other qualifications being equal, has the first call upon your consideration.

In addition to this, the Committee are forwarding the following circular letter to all gas authorities advertising such vacancies in your columns:

> The Demobilization Committee of the Institution of Gas Engineers ask you, when considering the appointment of a suitable person to the post you advertise, please to bear in mind the claims of the ex-service man, should such an one make application, remembering that, all other things being equal, he has the right of the first call upon the consideration of his countrymen for whom he has fought and suffered.

They trust this letter will serve to keep the matter well in the minds of such bodies.

Needless to say, this appeal for consideration applies with equal force on behalf of officers and men already discharged, and particularly those who have suffered from wounds and sickness in their country's cause.

R. G. SHADBOLT,
Chairman, Demobilization Committee,
Institution of Gas Engineers.

39, *Victoria Street, S.W., Nov.* 28, 1918.

Unalterable Gas and Air Adjustment.

SIR,—In Newcastle-on-Tyne there are, I understand, a considerable number of incandescent burners of the "Metro" type with permanent gas and air adjustment. I believe the Gas Company have been washing gas with oil for the extraction of benzol, and that the gas supplied has had a calorific value of 450 B.Th.U. gross, or thereabouts. It would be interesting to know if this is so; also whether it is correct that, with the lower calorific power gas, the fixed adjustment burners have been doing quite well.

There are gas men who are of opinion that the South Metropolitan Company have been deprived of much manufacturing elasticity through the absence of water-gas plant, and the presence of fixed burner regulation. At the time of the coal strike, the Company's coal costs, according to "Field's Analysis," were per 1000 c.ft.: 1912, 14·81d.; 1913, 16·34d. The Gas Light figures were: 1912, 13·06d.; and 1913, 15·49d. The Commercial Company's costs were: 1912, 12·20d.; and 1913, 14·49d. In 1917, South Metropolitan coal costs were: 30·31d.; Gas Light and Coke Company, 29·38d.; Commercial Company, 29·29d.

Casting about for explanations of a fresh phase in deportment, the idea has been formed that, to the fixed regulation of the "Metro" burners, is due the Company's refusal or inability to oilwash for benzol, excepting on so small a scale as to be aptly described as experimental—the bulk of the benzol recovery in their case having been limited to tar washing, which permitted the trumpeted proclamation: "One Metropolitan Company has supplied gas of pre-war quality all along." If I am correctly informed as to Newcastle, then the supposition as to the influence of fixed regulation has no foundation in fact. Several gas men besides myself would be glad to learn from Newcastle whether the information is true.

It would be interesting to ascertain whether the recent newspaper correspondence and interviews with Press men were due to a great solicitude on the part of the Chairman of the South Metropolitan Gas Company for the customers of, as you put it, Sir, "his neighbours," or for the South Metropolitan Company, in view of manufacturing and commercial development, which that Company may not, through rigid adherence to coal gas and fixed regulation of burners, be so readily capable of taking advantage of as the "neighbours."

Nov. 27, 1918. A SATISFIED USER OF OIL-WASHED GAS.

Return of Gas Workers from the Army.

SIR,—With respect to the appeal made by Sir Arthur Duckham to the representatives of the gas industry at the meeting held in London on Thursday last, I should like to point out that, at the request of a number of our men who have been home on leave or who have been released from internment camps in Germany, we have written to the commanding officers of their respective units, offering to give them immediate employment if they could be released from military service, and have received the reply in every case that the commanding officer has no power to grant our request, while we have received notice of various cumbrous methods of demobilization which would involve enormous delay.

If Sir Arthur Duckham could use his new authority to clear-away the red tape with which Government departments seek to hamper his most praiseworthy efforts, he would be conferring a favour both upon the men who have won the victory for us and also upon their employers, and at the same time give a powerful practical send-off to his own appeal.

H. TOWNSEND.

Wakefield, Nov. 29, 1918.

The Home Supply of Benzol.

SIR,—The importance of maintaining the home supply of benzol is a lesson which we are not likely to forget; and in the article on "The Future Disposal of Benzol," in your issue of Nov. 26, you rightly point out the danger of the petroleum magnates obtaining the control of British benzol.

The natural outlet for the bulk of the benzol in this country, in peace time, is undoubtedly motor spirit. If motor benzol be kept free from outside influence, it will be in competition with petrol; and, to hold its own, it must not only be as cheap but it must be as good.

Before the war many motorists objected to benzol, owing to its uncertain quality. In 1913, I collected samples of motor benzol from different parts of the country. The quality of many of these was so bad that it is a matter of no surprise that benzol was looked upon with suspicion.

Motor benzol in future must be produced of standard quality all over the country. This is absolutely necessary, whether it be used as benzol or mixed with alcohol as suggested by Mr. W. R. Ormandy. A specification put forward by any individual will be of little value unless generally and officially adopted. I suggest, therefore—as the matter is of such national importance, and involves so many varied interests—that producers should at once appoint a small Committee, composed of chemists, motor engineers, and commercial men, to lay down a standard. Such a standard, in my opinion, might include Grades 1, 2, and 3; and each should at least include limits for specific gravity, carbon disulphide, benzene and toluene, the degree of washing, and freedom from water. This latter point is one which often gives trouble to motorists. Benzol dissolves water to a small extent, according to its temperature; and when the temperature drops, the water is thrown out of solution. The dissolved water can easily and cheaply be removed at the works.

Any standard method which is laid down for the testing of benzol should be on scientific lines; and the old method of distilling with the thermometer in the liquid should be abandoned.

This also raises the question of the testing of crude benzol. The majority of mixtures of chemical substances are bought and sold on accurate chemical analysis. There is now no difficulty in estimating the quantities of carbon disulphide, paraffins, benzene, toluene, xylenes, and creosote oil in crude benzol. It is time, therefore, that the old and inaccurate method of estimating the value of crude benzol should give place to modern methods.

M. WYNTER BLYTH.

The Laboratories, Thorncliffe, near Sheffield, Nov. 28, 1918.

REGISTER OF PATENTS.

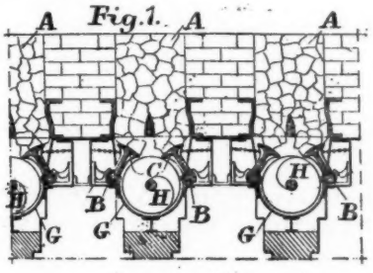
Discharging Coke from Vertical Ovens or Retorts.

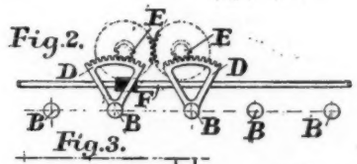
No. 113,436.

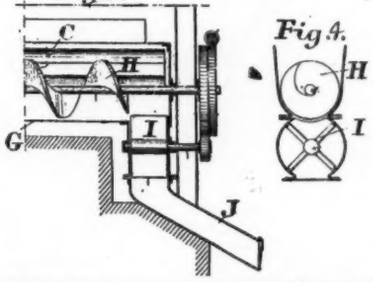
PIETERS, J., of Paris.

No. 1273; Jan. 22, 1918. Convention date, Feb. 16, 1917.

The object of this invention is not only to bring about the expulsion of the coke from the oven, but more particularly to prevent any crushing of the coke, or any breaking of the pieces, which will be able to retain their natural size, and, moreover, to ensure a perfectly tight joint at the base of the oven.







Pieters' Coke Discharger for Vertical Retorts and Ovens.

Fig. 1 is a vertical section through the lower part of a battery of vertical ovens, showing the movable grates supporting the coke.

Fig. 2 is a vertical outside elevation of the device for operating the grates. Fig. 3 is a vertical longitudinal section of fig. 1. Fig. 4 is a vertical cross-section of part of fig. 3.

At the base of each of the ovens A are mounted on metal brackets two parallel horizontal spindles B, to each of which are keyed teeth or blades C, each tooth, or series of teeth, constituting half the movable grate supporting the coke at the lower end of the oven. A movement of rotation in opposite directions can be communicated to the two spindles of each pair by mechanism arranged outside the oven, comprising a toothed quadrant D keyed to each spindle of each quadrant being in engagement with a toothed pinion E keyed to a spindle parallel to the spindle B and carrying a toothed wheel. A transverse spindle F (which is one and the same for all the ovens of the battery) drives each pair of spindles B corresponding to one oven, by means of a worm—the two wheels corresponding to one and the same oven engaging with each other. One of the different pairs of teeth or blades can be brought nearer to, or further away from, the other, by turning the transverse spindle F. The teeth can move away to the sides, and thus open the whole lower section of the oven. The latter is closed beneath the supporting grate constituted by the teeth C, by a reservoir G (having the shape of a portion of a drum) in which rotates the conveying apparatus proper used for removing the coke in the horizontal direction. This apparatus is shown as constituted by a worm or archimedean screw H keyed to a horizontal spindle.

Behind the reservoir G containing the horizontal conveying apparatus, and at the side of the oven opposite that on which is mounted the outside driving mechanism for the movable grates C, the coke is brought into a small rotary apparatus used for expelling it while maintaining a perfectly tight joint of the oven. This apparatus comprises a drum I with several blades, secured to a spindle which is driven at the desired speed by toothed wheels driven at the speed required by the worm and the worm wheel. Any admission of air into the lower portion of the oven is prevented by the blades of the drum I. The coke escapes subsequently through the inclined channel or shoot J.

Supplying Gas at Low Pressure from Storage at High Pressure.—No. 119,319.

FLUGEL, B. J. V., of Green Lanes, Newington Green, N.

No. 15,934; Nov. 1, 1917.

In carrying this invention into practice, the gas coming from the container under a pressure of (say) 120 atmospheres is led past a stop-valve to a reducing valve (advantageously not of the needle type) in which a disc on one part of a crank-like device is acted on by the gas pressure to force another part of it against, or towards, the mouth of the passage through which the high-pressure gas is admitted to the reducing valve chamber. This reduces or stops the further passage of gas under pressure through the outlet until the crank device is acted on by an adjustable powerful spring (when the pressure in the crank chamber is reduced) to admit further gas from the container. The reducing valve thus automatically keeps constant the pressure of the gas, which it allows to pass and enables a large volume of gas to be reduced and passed from the container for use.

From the reducing valve the gas, under greatly reduced pressure, is passed into a receiving chamber of any suitable size, shape, and strength. For example, for motor vehicle purposes it may be a light metal bottle of cylindrical shape (say, about 10 in. long by 3 in. diameter), the outlet from which is controlled by an adjustable and non-return self-acting valve, such as a spring relief valve, which can be "set" according to the reduced pressure to which the reducing valve is adjusted. Through this outlet from the receiving chamber the gas is led away, in the case of an internal combustion motor (whether stationary or mobile, as on a motor vehicle), through an outlet connected to the induction pipe of the motor—the valve in the outlet being adjusted almost in equilibrium with the reducing valve, so that on each inspiration from the engine cylinders the gas will be freely drawn past the control valve into the cylinder of the engine.

Manufacturing Power Gas and Recovering Hydrocarbon Oils.—No. 120,051.

CHAMIER, F. W., and CRAIG, H. J., of Waterloo Place, and MOELLER, J. F. L., of Victoria Street, S.W.

No. 18,335; Dec. 21, 1916.

This invention has for its chief object to increase the amount of high-grade or light oils obtained from the fuel employed and to keep the proportion of tar as low as possible.

In the production of Dowson or mixed water gas for power and heating purposes, according to the usual mixed air and steam process, the patentees remark that small quantities only of condensible hydrocarbons are obtained, owing to the high temperature at which the reactions take place; and in cases where it has been proposed to treat the fuel in a preliminary stage with hot gases derived from the final stage, and which gases may be mixed with steam, the object has been to recover ammonia and obtain permanent gases by high-temperature treatment and not to obtain a large yield of light oils.

They propose to effect the distillation and combustion of the fuel in two successive stages; part of the gases from the second or gas generating stage being mixed with steam and reduced to a relatively low temperature and caused to act (at the reduced temperature of about 450° to 650° C.) upon the fuel in the first stage—the temperature being such that the volatile hydrocarbons are distilled off in large quantities and cracking is avoided owing both to the low temperature and the presence of steam. The oils are recovered by condensation.

In a convenient method of carrying the invention into effect the gas-generator is arranged so that the fuel, fed into the top of it by a hopper and resting at the bottom on a grate (below which the air and steam may be introduced), descends as it is consumed. The whole, or a large part, of the gas formed in the lower zone of the generator is withdrawn at the upper part of the zone; while part of the gas, together with a further supply of steam, is caused to pass through the upper zone, and react with the cooler fuel at a temperature of 450° to 650° C.

The temperature is usually considerably below the upper limit, but varies according to the quality of coal—being relatively low for soft coal and higher for hard coal or coal containing much ash. In this upper zone condensible hydrocarbons are formed in large quantities and are drawn off from the upper part of the generator and condensed. At present, the gases in the lower part of the ordinary generator pass at a higher temperature through the cooler fuel in the upper part and carry-off with them any hydrocarbon vapours which may be formed; but the amount and quality of the oils so obtained are said to be low, since both amount and quality decrease as the heat of formation increases.

Maintaining Proportional Delivery of Gas and Air to Gas-Fired Furnaces.—No. 120,076.

KEITH, J. & G., of Farringdon Avenue, E.C.

No. 15,253; Oct. 20, 1917.

This invention relates to apparatus for maintaining proportional delivery of gas and air to gas-fired furnaces notwithstanding variations in the resistances to the flow of these fluids or in their relative pressures.

In patent No. 16,711 of 1915, the inventors described an arrangement adapted to maintain the proportions of gas and air which are already mixed before admission to the furnace; while the present invention is applicable to furnaces in which the gas and air are introduced separately.

The apparatus employed for the purpose consists essentially of two diaphragms, pistons, bells, or the like (in separate compartments) operatively connected to each other and to an admission valve for the controlled fluid. One pair of opposing sides of the diaphragms is influenced by pressure differences set up by the rate of flow of the controlling fluid; while the other pair are influenced by the pressure differences across a manually adjustable resistance between the admission valve and the discharge of the controlled fluid in such a way that they balance one another.

Gas-Bags.—No. 120,088.

RUSSELL, R., of Middleton, near Manchester.

No. 15,535; Oct. 25, 1917.

This invention is intended to provide gas-containers capable of resisting much higher internal pressures, and therefore of carrying relatively much larger effective charges, than heretofore.

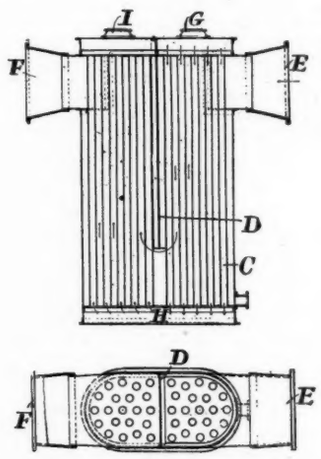
The gas-bag, which consists (as usual) of a distendable inner bladder of rubber or like material and an outer protective envelope of collapsible but non-distendable material such as canvas, and which when inflated tends to assume a circular cross-section, is made with an outer cover of vulcanized rubber and canvas comprising two or more sections, whereof adjacent sections are united at a circumferential joint. The edge of each section is formed with a beading, and the beadings on the edges of two adjacent sections are adapted to interlock respectively with inturned flanges on a circular metal hoop in such manner that, on the inner bladder being inflated, the beadings are forced into engagements with the flanges of the hoop, so that the higher the internal pressure the more secure will be the interlocking engagement.

Destructive Distillation of Carbonaceous Substances.—No. 120,223.

WELLINGTON, S. N., of London Wall, E.C.

No. 10,973; July 30, 1917.

This invention in low-temperature coal distillation has for its object "to reheat the gas and vapour after it has been cooled for the condensation of its content of tar, whereby the ammonia may be completely recovered without the simultaneous substantial condensation of water."



Wellington's Low-Temperature Distillation Plant.

The gas produced, after being deprived of its tar, is passed through a "heat exchanger" in which it is heated by producer gas. This heat exchanger may take the form of a casing in which a number of tubes are disposed up which the low-temperature gas passes, while in the casing and outside the tubes the producer gas passes. The casing may

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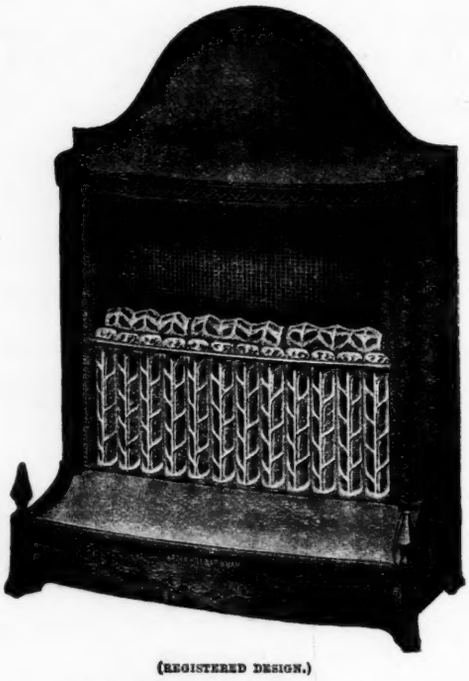

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contain a number of units comprising sets of tubes within an enclosing tube along which the respective gases pass so that the low-temperature gas may be heated to a temperature of (say) 100° C. The temperature of the gas as it leaves the gas-producer is on an average usually about 500° C.; and "a considerable part of the heat of the gas may thus be usefully employed according to the invention." After being re-heated, the low-temperature gas is passed through a saturator in which the ammonia is recovered by acid maintained at about 80° C.; and the gas, after traversing the saturator, may pass to a condenser and be "otherwise treated as is usual in gas manufacture."

The heat exchanger is represented in sectional elevation and sectional plan. It consists of a casing with two plates for the reception of the ends of a series of parallel tubes C. The casing is centrally divided by a partition D which leaves a communicating space at the bottom. The hot producer gas enters at E, passes downwardly on the exterior of the tubes, and then upwardly on the opposite side of the partition, and thence through the outlet F. The rich gas produced in the low-temperature distillation passes through the inlet G, thence through the tubes on one side of the partition into the space beneath the lower tube plate, returning upwardly through the tubes on the other side of the partition and thence through the outlet I.

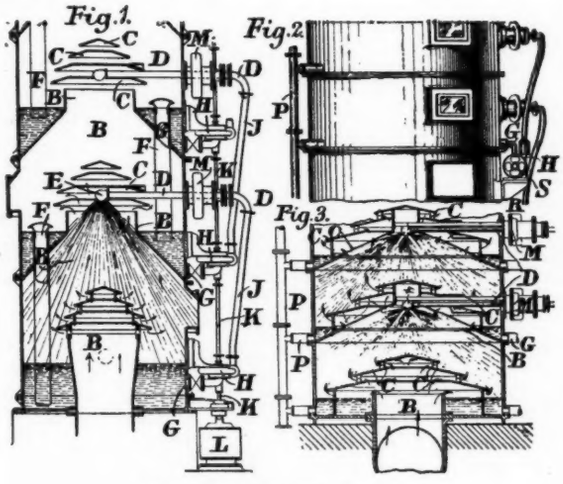
Bringing Gases and Liquids into Intimate Contact. No. 120,304.

HILTON, R. S., and WILLIS, J. H., of Birmingham.

No. 218; Jan. 4, 1918.

This invention refers to apparatus which depends upon the washing chambers being substantially filled with a fine liquid spray through which the gas passes; the apparatus being divided into superposed concentration chambers provided with a liquid supply and outlet and preferably draining outlets from each chamber.

The object aimed at is to produce apparatus in which the liquid in each of the superposed chambers is given local circulation and concentration without the use of high-speed moving parts within the chamber. This is attained by connecting a liquid outlet pipe from each chamber with the suction side of a pump; the delivery pipe from the pump being carried back to the chamber and the liquid distributed in the form of spray.



Hilton and Willis's Gas-Washer.

Fig. 1 is a vertical section of a portion of one form of the apparatus. Fig. 2 is an elevation of the upper chambers of another form; and fig. 3 a section of the lower chambers.

In fig. 1 conical division plates between the chambers leave central gas-passages B, with a hood or deflecting plate of louvre form at C over each passage, so as to deflect the gas under the hood toward the sides. Liquid distributing pipes D, provided with a spray-producing nozzle immediately below the gas passages, distribute the spray "in the best position for ensuring intimate contact of the liquid with the gas." The ordinary liquid overflows F leading from one chamber to another are preferably staggered from side to side down the apparatus. The liquid outlet from the bottom chamber leads to a collecting well or elsewhere, as desired.

The liquid collects on the division plate of each chamber at a level determined by the position of the overflows, and from each chamber is a communication G, on the suction side of a pump H, whose delivery pipe leads up to the liquid distribution pipe D for that chamber. The pump shafts are connected-up to form one driving shaft K from a motor L.

It is preferred to carry the pipe D into each chamber through a gland and valve box M, so that any pipe may be removed and the valve closed behind it without disturbing the working of the other distributors, or of opening the chamber to the atmosphere. The arrangement for the mounting of the sprayer pipes for this purpose and the construction of the valve-box are described in patent No. 120,345.

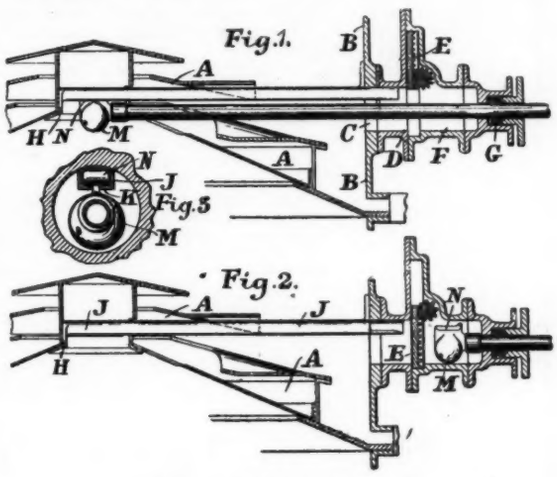
In the apparatus shown in figs. 2 and 3 the divisions between the chambers are cones of more gradual slope, and the gas-passage B is much larger, and roofed over by a louvre cover C, with spaces under for the gas to pass out. A perforated grid O may be arranged over the gas-passage in each case; and scrubbing material may be mounted thereon. In this arrangement (which is a form suitable for washing coal gas for the removal of ammonia), no special overflows are shown other than over the lips of the bottom plates B. At P is a drain from each chamber provided with control cocks so that any chamber could be emptied at will for any purpose. The liquid distributing pipes D are provided with sprayers supported by a channel or guide R, along which the sprayer is inserted and removed as set forth in patent No. 120,345. Instead of a common motor for all the pumps H, a separate electric motor for each pump is employed supported on a bracket from the external wall of the chamber.

Apparatus for Spraying Liquids.—No. 120,345.

HILTON, R. S., and WILLIS, J. H., of Birmingham.

No. 7509; May 4, 1918.

This invention is designed to enable sprayers and their pipes to be readily removable from the apparatus in which they are used for inspection or repair, so that any of them can be removed without hindering the operation of the others. The invention is particularly applicable to spray apparatus for bringing gases and liquids into intimate contact for washing gases.



Hilton and Willis's Liquid Sprayers.

Fig. 1 is a sectional elevation of a sprayer as set forth in patent No. 120,304. Fig. 2 shows the sprayer withdrawn ready for removal. Fig. 3 is a cross section.

The type of apparatus to which the arrangement is applied consists of a number of superposed chambers with passages for the gas up the apparatus through the louvre division A between two chambers, and with liquid spraying means in each chamber to distribute a spray in the chamber, so as to bring it into close contact with the gas. Through the external wall B of each chamber is an aperture C, around which is secured a valve chamber D with a valve E to close it when desired. Beyond the valve is a further chamber F terminating externally in a gland G. Between the outer wall B and the sprayer—for example, the central top portion H of the division A—is a track or guide J having an inturned bearing flange K at each side leaving a central slot. The sprayer M is provided with a T-head N, which enters the end of the track and bears upon the flanges; the stem working in the slot and the head thus supporting the sprayer at any position along the guide.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Nov. 27.]

Nos. 18,846—19,337.

AKTIEBOLAGET INGENIÖRSFIRMA F. EGNELL.—"Gas-analyzing apparatus." No. 19,066.

APPLEBY, E. G.—"Apparatus for feeding fuel to gas generators, &c." No. 18,888.

BENTLEY, G. H.—See Appleby. No. 18,888.

BURNEY, C. D.—"Apparatus for distillation of solid carbonaceous material." No. 19,177.

CAMPBELL, T.—"Incandescent gas-burner." No. 19,089.

CHANDLER, D.—"Gas-heated furnaces." No. 18,983.

COLONA, G. C.—"Generation of gases for internal-combustion engines." No. 19,290.

DEMPSTER, R. & J.—"Ladder for use with gasholders, &c." No 18,941.

JACOB & Co., W. & R.—"Gas-burners." No. 19,090.

LE BRETON, W. H.—"Gas-stoves, ovens, radiators, and geysers." No. 18,975.

LE BRETON, W. H.—"Gas-fittings, lamps, &c." No. 18,976.

LITTLE, J. R.—"Spigot-and-faucet pipe-joints." No. 19,044.

LYNN, J.—See Little. No. 19,044.

M'INDOE, R. W.—"Gas-meters." No. 19,156.

MERZ & M'LELLAN.—"Low-temperature distillation of fuel." No. 19,083.

MICHIE, A. C.—See Merz. No. 19,083.

MOGFORD, J.—"Distillation of solid fuel." No. 19,199.

PURDY, W. J.—"Gas-burners." No. 19,090.

RUSSELL, A. C.—"Inverted gas-burners." No. 19,172.

SIDDALL, F. J.—See Dempster. No. 18,941.

SMITH, E. W.—"Gas-meters." No. 19,067.

SOUTH METROPOLITAN GAS COMPANY.—See Chandler. No. 18,983.

SURRIDGE, L. T.—See Le Breton. Nos. 18,975, 18,976.

TAUNTON, R. P.—See M'Indoe. No. 19,156.

WEEKS, E. G.—See Merz. No. 19,083.

PARLIAMENTARY INTELLIGENCE.

NOTICES GIVEN FOR BILLS (SESSION 1919) RELATING TO GAS SUPPLY.

[*Continued from p.* 473.]

Hartlepool Gas and Water Company.—In a Bill of which they give notice, the Hartlepool Gas and Water Company will seek powers relating to both branches of their undertaking. There will be clauses regulating the supply of gas and fittings, and to enable them to dispose of lands and to lay mains in streets not dedicated to public use. They desire further powers in regard to the working-up, &c., of residual products, and authority to purchase such residual products from other gas undertakings or persons and dispose of them or products manufactured therefrom. Other clauses of the Bill will relate to the purchase from companies or persons within or without the limits of supply of gas in bulk produced in connection with the carrying on of any works, trade, or business; to the supply of gas in bulk within or beyond the Company's limits; to the laying of mains and culverts for procuring or disposing of oil or materials used by them or resulting from the manufacture of gas or any residual products; to the raising of further capital, and the amendment of existing provisions; and to the creation of redeemable stock or redeemable debenture stock. Another section will provide that any notice to be served or given on behalf of the Company, and requiring to be signed by the secretary or other officer, shall be sufficiently authenticated if the name be added thereto in print or reproduced by lithography, or by means of a stamp or any other mechanical mode of reproduction.

Sheringham Gas and Water Company.—Notice is given by the Sheringham Gas and Water Company of their intention to promote a Bill to prescribe a maximum charge for gas; to enable them to manufacture and deal in apparatus and fittings; to substitute a calorific standard for the existing illuminating power test; to make further provisions in connection with the supply of gas; to authorize variations in charge, according to the purposes for which the gas is used; to empower them to purchase, lease, or erect dwelling-houses for persons employed by them; to issue additional capital, as redeemable or irredeemable preference stock and redeemable debenture stock; to put into force a profit-sharing scheme; and to establish a pension fund.

Stockton-on-Tees Corporation.—The Corporation of Stockton-on-Tees have on hand a tramway, motor omnibus, and ferry scheme; and in the Bill required in connection therewith, it is their intention to ask for further powers with reference to the working-up, &c., of residual products arising from the manufacture of gas, as well as authority to purchase such residuals from gas undertakings or others, and to deal with and dispose of them, and also to enter into agreements with regard to the utilization, treatment, and disposal of products obtained from the distillation of tar. The Corporation wish for the consolidation of their loans and the equation of the periods for repayment.

PROVISIONAL ORDER APPLICATION.

Elstree and Boreham Wood Gas Company.—The Board of Trade are to have an application for a Provisional Order, under the Gas and Water Works Facilities Act, from the Elstree and Boreham Wood Gas Company, Ltd., who wish for powers in connection with the enlargement and construction of works, the manufacture of gas, the raising of further capital, and the levying of charges.

LEGAL INTELLIGENCE.

NEGLIGENCE IN SUPPLYING TARVIA.

Bristowe & Co., Ltd., v. The Gas Light and Coke Company.

Abbott & Co., v. The Gas Light and Coke Company.

The above consolidated actions were before Lord Coleridge on Thursday last, in the King's Bench Division of the High Court of Justice.

Plaintiffs claimed damages in respect of the alleged negligence of defendants or their servants, or, in the alternative, damages for breach of contract in connection with the supply of tarvia on an implied warranty or condition that the material supplied should be reasonably fit for the purpose for which it was required. They also claimed an indemnity against any loss or damage which they might be held liable for in respect of damage occasioned through the defendants' negligence or breach of warranty.

Mr. COLAM, K.C., and Mr. SPOKES appeared for plaintiffs. Mr. COLEFAX, K.C., and Mr. A. NEILSON represented defendants.

Mr. COLAM said that Messrs. Bristowe & Co. did tar paving for public authorities; and for this purpose they used an apparatus into which they put a substance known as tarvia, which, after being heated, was sprayed on to roads. Tarvia was a bye-product of gas manufacture, and had been supplied by defendant Company under various contracts since 1900. Messrs. Bristowe & Co. hired vans and horses from Messrs. Abbott & Co. at 14s. per day, in connection with the work of spraying roads. They had fetched from the Beckton Gas-Works 32 barrels of tarvia, which was taken to the depôt at

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Wanstead. On May 31, a barrel of tarvia had been emptied into the boiler and heated, and a second barrel was being emptied. Unfortunately, this barrel did not contain tarvia, but a substance which, when brought into contact with the hot tarvia in the boiler, caused the contents to froth-up and run over, and, coming into contact with the fire-box underneath, it ignited and destroyed the trolley, and so seriously injured the horse that eventually it had to be killed. The fire also destroyed other property. On some of the contents of the second barrel being analyzed by Mr. W. J. A. Butterfield, it was found to be ammoniacal liquor. The defence was that the liquor was not obtained from the defendant Company. This could not be true, however, as the barrels were brought direct from Beckton to the depôt, and no material of any kind was obtained from any other contractor. Defendants further said that, if the liquor was supplied by them, the plaintiffs should have discovered the mistake, as liquor was placed in barrels bearing a blue bilge, and tarvia in black barrels. But this defence would not hold good, as when the rest of the consignment was examined another barrel bearing a blue bilge was found, and this contained tarvia. The fact was defendants used any old barrels that could be purchased. As the stuff was invoiced as tarvia, plaintiffs were entitled to consider the article supplied was according to contract, and not of a dangerous character. A further defence was that there was a special clause in the contract which exonerated defendants.

Mr. COLEFAX said he did not propose to rely upon this part of the defence.

Mr. COLAM said that being so, the only point was whether the liquor came from the defendants, and the amount of damages.

Evidence was given that the barrel in question came from defendants; that the barrels were generally of uniform character, though occasionally a varied lot was supplied; and that there were no barrels at the depôt except those which came from Beckton.

Mr. *W. J. A. Butterfield*, who had analyzed some of the stuff, said it was ammoniacal liquor containing cyanogen products, which were produced at gas-works. He knew that from 1893 to 1906 this liquor was produced at the defendants' works.

Cross-examined: He did not think the South Metropolitan Gas Company produced such a liquor, as they used a different process. It was possible, however, that the Brentford Gas Company made such a liquor. It was really a wash liquor.

The *Manager* of Messrs. Bristowe said they had bought tarvia from the South Metropolitan Gas Company, but it was not used on this particular job. The only tarvia used at Wanstead was obtained from the defendant Company.

His LORDSHIP, after hearing other evidence, found for plaintiffs, and awarded £166 as damages.

No Gas in Armagh.—Owing to a workers' strike, the gas supply in Armagh was cut off for some nights, and people had to resort to oil lamps and candles for the transaction of business.

MISCELLANEOUS NEWS.

INCREASING DIVIDENDS UNDER THE NEW ACT.

A report presented by the General Purposes Committee to the Lambeth Borough Council stated that communications had been received from the South Metropolitan and South Suburban Gas Companies, enclosing notices of applications for Orders enabling them to increase their dividends under the Statutory Undertakings (Temporary Increase of Charges) Act. The Committee said:

In the case of the South Metropolitan Gas Company, the standard price for gas is 3s. 1d. per 1000 c.ft., and the standard dividend is 4 p.ct. per annum. For every 1d. increase in the price of gas over the standard price, the dividend is automatically reduced by 2s. 8d. p.ct.; so that, as the present price of gas is 4s. 4d. per 1000 c.ft., the dividend is reduced to 2 p.ct. per annum. If the application of the Company is granted, the dividend would be increased to 3 p.ct.; and it would appear that the price to be charged by the Company for gas, to enable this to be done, would be raised to 4s. 11½d. per 1000 c.ft.

In the case of the South Suburban Gas Company, the standard dividend is 5 p.ct., and the standard price of gas is 2s. 9d. per 1000 c.ft. The present price of gas is 4s. 3d. per 1000 c.ft., and the dividend is reduced by 3s. 4d. p.ct. for every penny increase in price, which now brings it down to 2 p.ct. To enable the Company to pay three-quarters of their standard dividend—*i.e.*, 3¾ p.ct.—the price will have to be increased to 5s. 1½d. per 1000 c.ft.

The Town Clerk, after consultation with the Mayor, and the Chairman of the Committee (Alderman Evans), pointed out to the Board of Trade that the applications, if assented to *in toto*, would impose upon the already over-burdened tax and rate payers a charge out of all proportion to that which would otherwise fall upon the shareholders of the undertakings, and which, in view of the considerations raised before the Select Committee—particularly as to the financial position of the undertakings in past years—should not be conceded without the gravest possible consideration, so far as the financial positions of the Companies are concerned. Further, that in any event the Borough Council desired to submit that the Board should make no Order in these cases, except on such terms and conditions as will permit of it reviewing the same within a reasonably short period of (say) one year.

HOW GAS SERVES PROGRESS.

The Special Commissioner of the "Birmingham Post," in one of a series of articles on the "New Trade Era," says: The resources of our existing gas-works are equal to any demands which the Birmingham

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industries are likely to make for some time to come. All plant has been worked at full pressure during the height of the war effort; but the strain is relieved now. For the time being, it is a question, not of productive capacity, but of available coal. The appended table shows the tremendous strides made during the war in the industrial utilization of gas in Birmingham.

Year Ended Lady-Day.	Manufacture. C.Ft.	Motive Power. C.Ft.
1914	793,840,400	1,348,601,200
1915	905,271,000	1,363,358,200
1916	1,496,742,100	1,519,281,600
1917	2,216,048,400	1,509,714,500
1918	2,680,489,200	1,511,115,400

During the half year to Michaelmas last, the output of manufacturing gas increased by 5·96 p.ct., and that of motive power gas by 6·49 p.ct.

There has been a significant displacement of solid fuel by gas in the metal-working industries; and Birmingham specialists have taken a leading part in the development of furnace design and furnace practice. The progress made under the compelling urgency of the demand for munitions remains as a solid asset to-day, inasmuch as in its broad applications the effective heat treatment of metals is a *sine quâ non* of success in peace. Case-hardening methods, in which notable improvements have been effected in the last four years, are highly important to many of our regular manufactures. Developments in annealing, and in connection with the efficiency of gas-heated furnaces, have been studied more closely than ever before, not only by producers of furnaces, but by users in the great munitions factories.

ELECTRIC v. GAS COOKING TESTS.

If readers turn to our "Electric Supply Memoranda" to-day, and to a paragraph there headed "The Cooker Tests—Electrical Chagrin," they will understand better the following letter which Mr. C. R. Belling has addressed to the "Electrical Times:"

With regard to your notes under "Heating and Cooking" this week, *re* fuel economy and coal conservation, as these obviously refer to a test I had with the gas people, and as they give rather a wrong impression, I am writing you on the matter to make it clear it was simply and solely an informal test made by myself—I not in any way presuming to represent the electrical industry as a whole. The point is that after reading your remarks one would be led to think that the fault lay with the design and construction of the cooker. This is not so. The actual reason why there was a bigger shrinkage and bigger current consumption at this test than I had advertised was because I did the cooking myself, and was not sufficiently used to an oven with 70 lbs. of meat in it, and didn't do myself or the cooker justice. However, it should be mentioned that to whatever degree the figures were short of the results that can be obtained by electrical cooking, they actually did show an advantage in the net yield of cooked meat which would pay for the current used three or four times over. The gas company are just taking advantage of the position, which, although it may not be exactly "cricket" on their part, one can hardly blame. However, I shall be taking another test shortly, when, by the experience I gained in cooking at the last, I have not the slightest doubt in being able to maintain our advertised claims. Although the gas company refuse to join me in another similar test, I don't think this makes much difference, as I shall invite the same umpire and several independent witnesses. When I have got the best results out of our oven that we can, I shall publish the figures. I shall also give the gas company the choice of allowing me to publish the gas losses and figures obtained at the last test (which was a private one), or meeting me in another public test. Finally, if what I have done so far proves to have the effect which you now put into expression, of getting the supply companies and manufacturers together to really co-operate by combined propaganda and advertisement to boom the electrical industry, it will be about the best thing that can have happened. Needless to say, I should be quite prepared to at once stop my individual challenges to the gas people if the matter is taken up by a committee; and, further, I should be quite prepared to enter any competition arranged among ourselves to find out, first of all, which is the best electric cooker on the market, and the one most likely to do the industry credit in an open public trial with gas.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Dec.* 2, 1918.

Conditions in the tar products market are a little unsettled, owing to new conditions prevailing; but prices generally maintain a firm tone. There is considerable inquiry for pitch; the price being steady at not below 65s. per ton net f.o.b. makers' works. Benzol can now be supplied freely, and is interesting buyers as a motor fuel; the prices suggested being the same as for No. 1 petrol. Pure toluol is about 3s. 6d. per gallon net and naked at makers' works. Solvent naphtha 95/160 is about 3s. 9d. per gallon. Crude carbolic 60's is 3s. 6d. per gallon net in sellers' tank trucks at sellers' works. There is considerable inquiry for creosote and other tar oils.

The demand continues for sulphate of ammonia; the price of this fertilizer for December-February delivery now advancing to £16 5s. per ton to farmers or £15 15s. to dealers, basis 24½ p.ct., with usual increases according to the Government Order.

DAVIS Apparatus for National Kitchens

The claims of Gas in respect of any proposed National Kitchen are best advanced by recommending a complete DAVIS Installation.

Specifications and Prices as specially arranged with the National Kitchen Division.

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Tar Products in the Provinces.

Dec. 2.

The average values for gas-works products during the week were: Gas-works coal tar, 30s. 6d. to 35s. 6d. Pitch, East Coast, 44s. to 45s. per ton; West Coast—Manchester 35s. to 40s., Liverpool 35s. to 40s., Clyde 35s. to 40s. nominal. Benzol 90 p.ct., North, 10½d. to 11½d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha in bulk, North, 7¾d. to 8½d. Solvent Naphtha, naked, North, 2s. 11d. to 3s. Heavy naphtha, North, 2s. 11d. to 3s. Creosote, in bulk, North, 4½d. Heavy oils, in bulk, North, 5d. Carbolic acid, 60 p.ct. East and West Coasts, 3s. 6d. naked, nominal. Naphthalene, £25 to £30; salts, £6 to £7, bags included. Anthracene, "A" quality, 4d. to 6d. per minimum 40 p.ct.; "B" quality, 1½d. to 2d.

Manchester District Tar Prices.

The average price realized for tar in the Manchester district, based on the value of the products, for the month of October was £2 3s. 11½d. per ton.

FROM A MARKET CORRESPONDENT.

Tar Products.

There is very little now doing in these markets, as both buyers and sellers are still disposed to wait and see what is going to happen. At the same time, a more optimistic view of the situation is now taken generally. Pitch is very firm, especially in London; while even Provincial centres are asking 1s. or so per ton more. Better shipping facilities should be available shortly; and this should enable the large Continental demand to be taken full advantage of. Tars continue without much change; but fuel oils remain in urgent request. Some of the other leading products may be subjected to considerable price changes as controls are removed; and these price changes may come about without much notice. Already creosote, toluol, and naphtha have been placed in Class "C" for export, and can now be shipped without licences. But there is still some restriction with regard to destination, presumably with the object of preventing a supply from reaching Germany. It is further announced that in future oil and tar washing for benzol and toluol recovery may be conducted entirely at the discretion of the managers of gas-works, and that no action will be taken in the event of their deciding to discontinue the process entirely, or to effect a reduced rate of recovery. It is, therefore, probable that, while benzol remains under control, some of the large works will cease to recover this product. If quotations were permitted to rise naturally, this tendency might be lessened; for it is obvious that our requirements of fuel oils for motor purposes should be supplied as largely as possible from home sources. The present price of 1s. per gallon as motor benzol, however, implies a direct loss to producers under existing conditions. Consequently, every effort is likely to be made to get the restrictions withdrawn at the earliest possible moment. The control on toluol is withdrawn altogether, and the dye industry should be able to buy freely, although it is questionable whether buying on this account will make up for the cessation of the explosives demand. This is to be regretted, as Germany is making every effort to keep her dye industry well to the front. Chemists do not deceive themselves as to the (even now) astonishing amount of strength in the German dye industry. After the war Germany will mainly rely upon dyestuffs as articles of commerce destined to recover a place in the world's markets, and to compensate her trade losses in other directions. The making of the finished and useful dyes is not a difficult and complicated problem provided the proper so-called intermediates are available. The crux of the problem lies in the economical production of these intermediates—the bye-products of the gas and coke-oven tars. These products, however, have been at abnormal prices, owing to the demand for high explosives; and these prices must come down before our dye industry can be put on a good working basis. Anything that can be done towards this end should receive the support and encouragement of all concerned. As regards creosote, the Admiralty wish to be quit of their engagements, and the product is likely to be freed from all restrictions almost at once. Solvent naphtha is steady and unaltered; while the heavy is slightly dearer. Naphthalenes are without change. Anthracene and aniline oil are just steady. Cresylic acid is firm at last quoted rates. There is no news as to next year's fixtures in carbolic acids. The range of quotations is as follows:

Benzol: 90% London, 1s. 0½d., North 10½d. to 11½d.; 50% North 1s. 4d. to 1s. 5d. naked per gallon.

Carbolic Acid: 60% East and West Coast 3s. per gallon; crystals 40% 1s. 8d. to 2s. per lb.

Crude Tar: London 39s. to 41s.; Midlands 33s. to 35s.; North 32s. to 34s. per ton *ex* works.

Pitch: London 65s. per ton f.o.b. works; East Coast, 38s. to 42s.; West Coast, 41s. 6d. to 43s. f.a.s.; Manchester, 41s. to 42s.; Clyde, 41s.; South Wales, 45s. to 46s. per ton.

Solvent Naphtha: London 3s. 9d. to 4s.; North and Midlands 3s. 3d. to 3s. 6d. per gallon.

Crude Naphtha: Naked 30% 8½d. to 8¾d.; North 6¾d. to 6¼d.

Heavy Naphtha: London 3s. to 3s. 6d.; Provincial 3s. 3d.

Naphthalene: Refined £28 per ton nominal; salts 80s., bags included.

Toluol: Naked, London 2s. 4d.; North 2s. 3d.

Creosote: Nominal, London 4¼d.; North 4d. to 4¼d. (Government price, 75s. per ton f.o.b.—equal to 4⅝d. per gallon); heavy oil, 4¼d. per gallon in bulk.

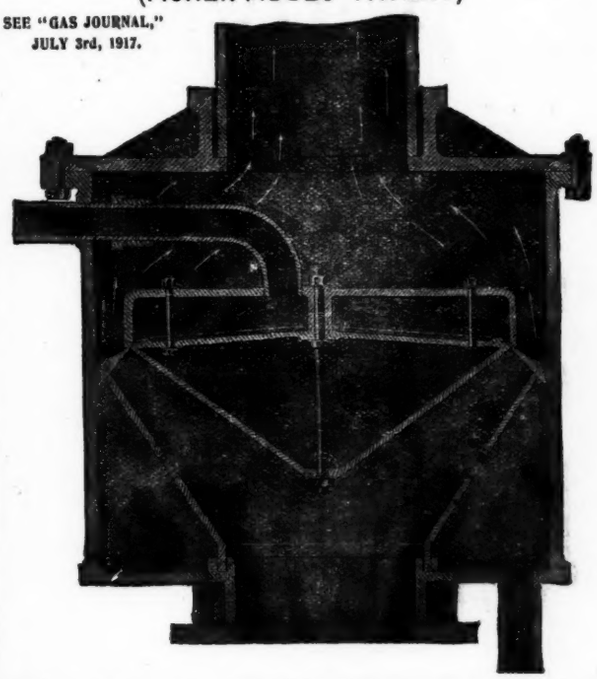
Anthracene: "A" quality, 40-45%, 4¼d. per unit; "B" quality, 1¾d. to 2¼d.

Cresylic Acid: 95%, 3s. per gallon; 97-99%, 3s. 3d. to 3s. 6d. per gallon, casks included, *ex* works London and f.o.b. other ports.

Grease Oils 18° Tw. (naked) £6 per ton f.o.r. makers' works.

"TAR FOG" & TAR EXTRACTOR
(FISHER-FIDDES PATENT)

SEE "GAS JOURNAL," JULY 3rd, 1917.



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Sulphate of Ammonia.

There is no change in the position of sulphate of ammonia; and there is no likelihood of any early relaxation of official control. I hope to go further into the situation in the next issue.

South Barracas Gas Company's Position.

The Directors of the South Barracas (Buenos Ayres) Gas and Coke Company, which was registered thirty years ago and has a capital of £300,000, of which two-thirds has been issued, are making what they describe as a final appeal to shareholders to submit to a minimum assessment of 15 p.ct. on their holdings, payable on allotment and secured by a proportionate amount of 6 p.ct. first debenture stock which has been specially released for the purpose. During the war period the Directors have themselves found funds to carry on. A request, made in 1917, to shareholders to subscribe for debenture stock met with an insufficient response to justify allotment. Since then the position has grown worse. Interest on the bank loan has remained unpaid; while since the middle of this year advances by the Directors have also received no interest. It is now stated that a receivership is the only alternative to the provision of further funds, that the Directors believe there is every hope that the fuel and freight position will soon improve, and that, given reasonable financial assistance, the business will recover. The amount required to pay the overdue interest, meet general charges, pay for fuel contracted for, and leave sufficient to carry on until reconstruction can be undertaken is placed at £30,000. For each of the three years to 1910 the Company paid a 5 p.ct. dividend, and in the following three 4 p.ct., since when nothing has been distributed. The accounts for 1917 showed a loss, after allowing £6876 for interest on loans, of £12,000, which increased an already existing debit to £27,698.

Abstracting Gas.—At the Dublin Southern Police Court, Mrs. Annie Devlin, Townsend Street, was prosecuted by the Alliance and Dublin Consumers' Gas Company for abstracting gas from the Company's pipes. Inspector Mooney deposed that he found the meter in defendant's house disconnected from the pipes, and that gas was being taken from the main by means of a tube. The Divisional Magistrate ordered payment of £5 compensation.

Gas Traction and the Manchester Exhibition.—The Inter-Departmental Committee on Gas Traction have promised to give their support to the British Scientific Products Exhibition to be held in the College of Technology, Manchester, during the last week of this month and the first half of January. The Committee will act in this matter in conjunction with the Gas Committee of the Manchester City Council; and arrangements have been made to include a standard London motor-omnibus equipped to run on compressed coal gas.

Disabled Men and Accident Risk.

The Home Office state that the Government have had under consideration the question of the application of the Workmen's Compensation Act in the case of disabled soldiers, sailors, or airmen returning to civil employment. A fear has been expressed that their disability may make such men more liable to meet with accident in the course of employment, or to make the results of an accident more serious than they would be normally; and, though experience in the past has not shown that on the whole the compensation charge in respect of men who have met with injuries is appreciably higher than the normal, the Government desire to remove any cause which might place a difficulty in the way of such men obtaining employment. They have therefore decided in principle that any increased charge incurred for compensation in respect of disabled men shall be borne by the State; and they have adopted a scheme which has been worked out by a Home Office Committee under the chairmanship of Lord Peel. The scheme proposes that an arrangement should be entered into by the Government with the insurance companies by which the companies would undertake to insure disabled men at the general rate for the occupation, and not to increase their general rates in the future as the result of the employment of disabled men; the Government under certain conditions to re-imburse the loss (if any) which the companies may incur. It will be open under the scheme to employers who do not wish to insure in respect of their general liability to insure their disabled men only at the ordinary rate. All men in receipt of disability pensions from the Ministry of Pensions will be regarded as disabled men for the purposes of the scheme. It is also proposed that in the case of large firms (paying not less than £100,000 yearly in wages), who carry their own risk, the Government should enter into special arrangements, if so desired, to re-imburse the firms any increase over the normal charge which they may incur in respect of the disabled men whom they employ. Any large firm desiring to enter into such an arrangement is invited to communicate with the Home Office. The details of the scheme are now being completed; and a further announcement will be issued later. The Government hope that these arrangements will do much to facilitate the re-employment of disabled men in industry.

Additional Bonus to the Edinburgh and Leith Gas Commissioners' Clerks.—Following the lead of the Edinburgh Corporation, the Edinburgh and Leith Gas Commissioners have decided to increase the bonuses to their permanent clerks, collectors, &c., as follows: To male employees who are in receipt of a salary of £200 per annum or under, £13 per annum (making a total bonus of £57 per annum), £13 per annum to male employees who are in receipt of a salary of over £200 but not exceeding £350 per annum (making a total bonus of £51 per annum), £6 10s. per annum to female employees (making a total bonus of £33 10s.), and £6 10s. per annum to apprentices (making a total bonus of £27 10s.). The bonuses are to commence as from Nov. 1 last, and to continue in operation for a period of six months from that date.

SAWER & PURVES,

THE POSITIVE DRY PREPAYMENT METER

MANCHESTER & NOTTINGHAM.

The Gas-Works Trouble at Knaresborough.

A special meeting of the Knaresborough Urban Council was held last Tuesday, to consider a Gas Committee recommendation that the price of gas should be increased from 4s. 3d. to 4s. 6d. per 1000 c.ft. as a flat-rate to all consumers, and that the usual discount of 5d. per 1000 c.ft. be reduced to 2d. The Chairman (Mr. J. Barker) said the estimates for the current year showed a deficit of £780, and the deficit last year was £945; making over £1700 to the bad in two years. The make of gas at present was only 10,000 c.ft. per ton of coal, and they could not expect to make a profit if this was not altered. Mr. Hewson said there had been a leakage last year of 6,000,000 c.ft. An attempt was being made to "whitewash" the whole business. Mr. Pickering said if they continued with their rotten system and rotten works they would soon lose the interest on £5000 a year. The Clerk reminded the Council that the times were exceptional, that unusually enormous prices were being paid for coal, and that the cost of labour had greatly advanced. The Chairman said that a few days after the last meeting of the Council he was told that the gas supply was going to be cut off again. With members of the Committee, he went to the works and found the holders nearly down to the ground. When he went to the engine, he was told that if he touched it it would fall to pieces. If this was the case, he thought the sooner it happened the better. When he went to another department, the Manager and the foreman declined to take any responsibility. The Chairman had replied, "Then I will;" and before he left the works the holders were going up, everything was working all right, and there had been no stoppage. He was convinced that if things were carried out on the same lines they would be getting far more gas than they had been doing. The meeting adopted the recommendations, and instructed the Clerk to secure the services of an expert to overhaul the works and report.

Motor Spirit and Gas Restriction Amendment Order No. 2.—This Order, which came into operation on the 1st inst., provides that: "Nothing in paragraphs 2, 3, 4, 5, or 9 of the Principal Order, or in paragraph 3 of the Amendment Order, No. 1, shall prevent the use of petrol or petrol substitute obtained under the provisions of a motor spirit licence, or of gas by the holder of a gas permit, for the purpose of driving any motor vehicle or motor boat for any purpose within a radius of 30 miles from the place where such vehicle or boat is usually kept."

The Greatest Economy Essential.—The Local Fuel Overseer at Hastings, giving notice that, though the armistice has been signed, the provisions of the Household Fuel and Lighting Order, 1918, are still in full operation, says it is essential that the greatest economy in the use of both should be exercised. There is not likely to be any material increase in the supply of fuel and light to household consumers in this country for a long time to come, and supplies may be both short and irregular during the winter months. Economy and care are therefore needed more than ever.

Quality of Dublin Gas.—Mr. E. N. Allan, the Dublin City Gas Examiner, replying to criticism of the quality of gas supplied by the Alliance and Dublin Consumers' Gas Company, and a request that the Company should be "compelled to give a proper quality," says that in 1915 the Corporation were notified by the Ministry of Munitions that the Gas Company were working under their directions, and were relieved from any forfeiture or other penal consequences in the event of the gas supplied being found to be below the standard. This notification had not been withdrawn. The Ministry also stated that the Corporation should either cease to have tests made of the gas, or, if they were made, the results should not be published.

Trouble with Gas Workers at Coatbridge.—The stokers and coke-trimmers employed by the Coatbridge Gas Company, dissatisfied with the Company's refusal of a holiday to celebrate the armistice, as in the case of some other workers in the town, and also refused a money allowance, came out on holiday on Friday and Saturday last as a protest against the Company's treatment. There being about forty workers thus disaffected and idle, the gas supply of the town and district was seriously imperilled; and the management issued a notice to the consumers intimating that, owing to the illegal decision of the stokers and coke-trimmers in absenting themselves from their work on Nov. 29 and 30, it might be necessary to reduce the pressure of the gas from 10.30 p.m. on Friday, so that the supply might be conserved as far as possible for lighting until work was resumed on Monday. There was a probability, the notice continued, that the supply might fail entirely; and consumers were urged to be economical during the emergency, to avoid this taking place. Fortunately, though a good many consumers found the pressure insufficient, and candles and lamps had to be resorted to, thanks to the reserve supply of gas on hand, the town was not left in darkness. Moreover, the staff of the Company loyally came to the rescue, and helped to tide over the emergency.

Coal Shortage at the Edinburgh Gas-Works.—The position of affairs at Edinburgh with respect to coal has not improved since our last reference to the subject (*ante*, p. 315). The make of gas per ton of coal has fallen from 10,058 c.ft. in September to 9942 c.ft. in October, and the stock of coal has been reduced from 15,000 to 10,000 tons as at the 11th ult. In a letter to the Convener of the Works Committee, Mr. Alexander Masterton, the Engineer and Manager, stated that on the 8th ult he visited the Coal Controller in Glasgow, and set before him in detail the serious situation in which the Commissioners were placed. This the Controller seemed to have comprehended; and he assured Mr. Masterton that he was at the moment engaged in compiling a new allocation of coal supplies based on the consumption for last year, less from 10 to 12 p.ct.—the balance to be made up, if possible, with water gas. If this arrangement should be found inadequate, steps must be taken to bring about a reduction in the output of gas. Should his proposed arrangements assume practical shape, the recent stress will be to some extent relieved. If, however, the usual holidays are observed by the miners during the New Year, Mr. Masterton is afraid that the stock will be entirely depleted by the middle of January next. The diversion of 830 tons weekly of the Commissioners' supplies of coal to other works, which was ordered by the Coal Controller on May 30, was withdrawn by him on Oct. 19.

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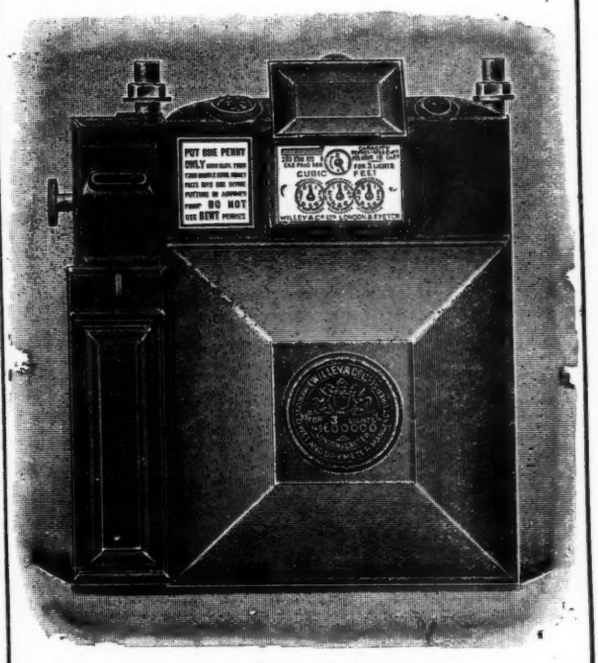

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Gas Supply Troubles at Goole.—The question of inadequate lighting of the town was discussed by the Goole Gas Committee last week. It was reported that, owing to the influenza epidemic, every one of the stokers was off work; and the Manager, with other assistance, has had to do the stoking, in order to keep the town supplied with gas. Only one lamplighter remained.

Gas Profits at Keighley.—The Keighley Corporation Gas Committee have just issued a report showing net profits for the year ended June 30 amounting to £5126, out of which the cost of public lighting (£738) is to be defrayed by transference to the general district rate. A sum of £4000 is to be transferred to working capital account, £50 will be granted to the local Victoria Hospital, and £338 will be carried forward.

Working under Difficulties at Rothwell.—On Monday evening last week, the stock of gas at the Rothwell (near Leeds) works became exhausted. Owing to conditions generally, but particularly in consequence of coal failing to come to hand in sufficient quantity, the works have been running under great difficulties for some months past. The holders had been empty for a couple of weeks before the complete giving-out.

Scottish Gas Undertakings as Investments.—At a meeting of the Committee of the Convention of Burghs, held in Edinburgh under the chairmanship of the Lord Provost, a report was presented by the Law Agent of the Convention with reference to corporation gas undertakings. It stated that legislation has now been secured by which such concerns had become securities of the first class. Mr. Burns (Town Clerk of Motherwell) pointed out that hitherto no large insurance company would lend money on these undertakings, because they were not regarded as first-class investments.

Gas Supply of Brierfield Threatened.—Last Wednesday, the Nelson Branch of the General Union of Workers took action which may eventually result in the stoppage of the gas supply. The Nelson Corporation supply Brierfield with gas, and for this purpose have works in the latter township. Three months ago, a strike took place of scavengers, because the Brierfield Council would not pay a war bonus; and the places of these men have largely been filled by discharged soldiers. All efforts to move the Council have failed; and as the strikers are members of the same union as the gas workers, the latter have, as their first threat, decided to cut off the gas supply to Brierfield. For this purpose, they served notices on Wednesday last; and these are to expire a fortnight later.

STOCK MARKET REPORT.

THE Stock Exchange last week relapsed again into a state of numbing inactivity, which grew more marked as day followed day, until absolute low-water mark was reached on Friday. The impending General Election is regarded as being mainly responsible, and, with the Christmas Holidays closely following, no adequate revival should be expected before the New Year. The tendency varied in markets according as special circumstances affected them; but the more predominant tone was dull.

This was the case in the gilt-edged market, where Government issues were weak. War Loans tried to rally, but closed lower; and Consols touched 59 9/16 on Friday. Indian stocks were similarly affected. Home Rails drooped from lack of support; buyers holding aloof. Canadians were easy, and Argentines again had a fall.

In the Foreign Market the feature was the strength of French Loans, both old and new; but Russian were not in request. In the Miscellaneous, things were mixed. Rubber and Oil were only moderate; but Iron and Steel industries, engaged in converting their swords into peaceful implements, were decidedly firm.

Business in the Gas Market was quiet and devoid of any specially interesting features, apparently under the spell of the prevalent torpor. Gas Light and Coke and Imperial Continental monopolized most of the transactions, but even they were well below their average score. The tendency on the whole was favourable. The variations in quotation were in by far the greater number of instances in the upward direction. All issues of the Metropolitan Companies were unchanged. In the Suburban, South Suburban rose 2. In the Provincial, Newcastle was higher and South Shields was lower. In Foreign, Hong Kong and China, Malta, Monte Video, Oriental, and Primitiva (1911) were all of them higher, and Imperial Continental and Primitiva ordinary were lower.

Bargains done for cash during the week were as follows: On Monday, Brentford "A" 79½, Gas Light ordinary 70, 70⅝, 70¾, 71, 71¼, ditto preference 68½, 69, ditto debenture 57, Hong Kong 7⅞, Imperial Continental 126, 126½, 127, 127½, Monte Video 9¼, 9½, Primitiva 46s. 10½d., South Metropolitan 75½, Wandsworth, Wimbledon 72, 72½. On Tuesday, Gas Light ordinary 70½, 70¾, 71½, Imperial Continental 126, 126½, 127½, North Middlesex 10⅞, Primitiva 45s., 46s. 3d., ditto preference 73s. 9d., South Metropolitan 74½, 74⅞, 75, 75¼, 75⅜. On Wednesday, Gas Light ordinary 70⅜, 71⅜, 71½, ditto maximum 55¾, ditto preference 68½, ditto debenture 56, Imperial Continental 125, 125½, 126, 126½, Primitiva 45s. 3d., ditto preference 72s. 10½d., South Metropolitan 75½, Southend 5 p.ct. consolidated 69½, 69⅞. On Thursday, British debenture 65, Gas Light ordinary 70⅜, 71½, 71⅜, ditto debenture 56½, 56⅜, Imperial Continental 125, Monte Video 8⅝, *ex div.*, Primitiva 43s. 9d., 45s., 45s. 3d., ditto preference 72s. 6d., Monte Video 5 p.ct. debenture 77. On Friday, British debenture 66, Gas Light ordinary 71½, Imperial Continental 124, 125, 125½, South Shields new 115⅝.

In the Money Market, there was a steady demand nearly up to the close, when it eased. The Bank rate is 5 p.ct., as fixed on April 5, 1917.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Share.	When last Dividend.	Ante War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
183,049	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	55—60	..
1,551,868	"	April 8	2½	4⅜	Alliance & Dublin Ord.	59—64	51—56	..
274,000	"	July 10	4	4⅜	Do. 4 p.c. Deb.	76—79	62—67	..
280,000	£5	April 22	7½	8%	Bombay, Ltd.	57—62	51—53	..
50,000	10	Feb. 26	16	11⅛	Bournemouth Gas and Water { 10 p.c.	26—30	21—23	..
882,110	10	"	7	7%	B ⅞ p.c.	15—15½	10—11	..
115,000	10	"	6	6/-	Pref. 6 p.c.	13¼—14	9—9½	..
159,740	—	—	—	4%	4 p.c. Deb.	..	66—68	..
992,045	Stk.	Feb. 26	14	4⅜	Brentford A Consolid.	261—266	78—81	79½
784,990	"	"	11	4⅜	Do. B New	204—209	70—73	..
55,000	"	"	5	5%	Do. 5 p.c. Pref.	109—111	77—82	..
231,400	"	June 11	4	4%	Do. 4 p.c. Deb.	91—98	63—65	..
217,380	"	Feb. 26	11	8⅛%	Brighton & Hove Orig.	208—213	138—143	..
244,200	"	"	8	5⅛%	Do. A Ord. Stk.	154—159	95—100	..
580,000	£10	Mar. 26	12½	23/6	British	44—45	31½—32½	..
120,000	Stk.	June 26	4	4%	Do. 4 p.c. Deb. Stk.	88—90	64—66	65—66
245,771	"	"	4	4%	Buenos Aires 4 p.c. Deb.	85—87	51—54	..
100,000	10	—	—	—	CapeTown & Dis., Ltd.	1½—2½	3⅞—4½	..
100,000	10	—	—	4⅛%	Do. 4½ p.c. Pref.	4—6	7½—8½	8
100,000	Stk.	June 26	4½	4⅛%	Do. 4½ p.c. Deb. Stk.	70—75	60—65	..
157,150	"	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	79—81	..
1,518,280	"	Feb. 12	5/9/4	86/-	Commercial 4 p.c. Stk.	106—108	62—67	..
560,000	"	"	5½	80/-	Do. 3½ p.c. do.	103—105	58—63	..
475,000	"	June 11	3	3⅜	Do. 3 p.c. Deb. Stk.	69½—71½	52—54	..
800,000	"	"	4	—	Continental Union Ltd.	76—79	50—55	..
200,000	"	"	7	—	Do. 7 p.c. Pref.	115—118	70—75	..
278,400	—	—	—	10½%	Croydon B and C 7 p.c.	..	135—140	..
—	—	—	—	10%	Do. E	..	..	..
493,270	Stk.	—	6	5½%	Derby Con. Stk.	128—128	96—100	..
55,000	"	—	4	4%	Do. Deb. Stk.	102—104	80—83	..
1,009,180	10	July 29	10	5/0	European, Ltd.	17½—18	13—14	..
16,298,975	Stk.	Feb. 10	4/17/4	29/4	4 p.c. Ord.	98—102	70—72	70—71¾
2,600,000	"	"	8¼	8⅛%	Gas Light and Coke { 3½ p.c. max.	76—79	54—56	55¾
4,062,285	"	"	4	4%	4 p.c. Con. Pref.	96—99	67—69	68½—69
4,674,850	"	June 11	8	8%	5 p.c. Con. Deb.	72½—74½	55—57	56—57
190,000	"	"	10	10%	10 p.c. Bonds	..	..	..
258,740	"	Mar. 12	5	2⅜%	Hastings & St. L. 3½ p.c.	87—89	45—50	..
70,000	10	April 29	11	8%	Hongkong & China, Ltd.	16½—16⅝	7⅝—8½	7⅝
86,600	—	—	—	9⅛%	Hornsey 7 p.c.	..	112—117	..
181,000	Stk.	Mar. 12	7½	6⅛%	Ilford A and C.	151—154	92—97	..
65,780	"	"	6⅔	4⅜%	Do. B	115—118	70—75	..
65,500	"	June 26	4	4%	Do. 4 p.c. Deb.	92—94	62—65	..
4,940,000	"	May 14	9	4⅜%	Imperial Continental	150—160	124—129	124—127½
1,335,000	"	Feb. 12	8½	8⅛%	Do. 8½ p.c. Deb. Red.	84—86	71—73	..
235,242	"	Mar. 12	6⅔	6⅛%	Lea Bridge Ord. 5 p.c.	119—121	93—98	..
2,498,905	"	Feb. 26	10	5%	Liverpool 5 p.c. Ord. { A	211—215	82—84	..
					{ B	146—148		..
806,088	"	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	71—73	..
75,000	5	June 11	6	3%	Malta & Mediterranean	4½—4⅝	3½—3⅝*	..
250,000	100	April 1	4½	4½%	Met. of Melbourne { 4½ p.c. Deb.	99—101	87—98	..
541,930	20	May 28	4	6/-	Monte Video, Ltd.	11½—12	8⅜—9¼*	8⅞—9½
1,875,892	Stk.	July 29	4½	3⅛%	Newcastle&Gatsh'd Con.	98½—99½	70—71	..
529,705	"	June 26	3½	3⅛%	Do. 3½ p.c. Deb.	82—88	59—61	..
55,940	10	Feb. 26	7/16/0	7/0	North Middlesex 7 p.c.	14—15	9¼—10½	10⅜
800,000	Stk.	May 14	8	8%	Oriental, Ltd.	117—122	102—104*	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7⅛—7⅜	4—5	..
60,000	50	Feb. 26	13	9%	Portsea, Island B	125—131	78—83	..
100,000	50	"	12	8%	Do. C	118—121	73—78	..
52,000	50	"	10	6%	Do. D	..	..	..
249,980	5	April 29	8	—	Primitiva Ord.	5⅛—6	2⅜—2⅝	43/9—46/10½
499,960	5	June 26	5	2/6	Do. 5 p.c. Pref.	4⅝—5	3⅝—3⅞	72/6—73/9
621,600	100	June 2	4	4%	Do. 4 p.c. Deb.	91—98	76—77	..
—	—	—	—	4%	Do. " " 1911	..	69—67	..
846,198	Stk.	June 26	4	4%	River Plate 4 p.c. Deb.	85—87	55—60	..
150,000	10	May 14	6	6/-	San Paulo { 6 p.c. Pref.	10½—11	7½—8	..
125,000	50	July 1	5	5%	5 p.c. Deb.	47—49	40—42	..
135,000	Stk.	Mar. 12	10	10%	Sheffield A	293—294	170—173	..
209,984	"	"	10	10%	Do. B	293—294	170—173	..
538,500	"	"	10	10%	Do. C	290—292	168—172	..
90,000	10	May 28	9	6/-	South African.	10½—11½	12½—13½	..
5,609,895	Stk.	Feb. 10	5/4/0	32/-	South Met. 4 p.c. Ord.	111—113	74—76	74½—75
250,000	"	July 12	—	5%	Do. Pref.	..	91—98	..
1,895,445	"	July 10	8	8%	Do. 3 p.c. Deb.	72½—74½	55—57	..
224,820	"	Feb. 26	8½	6%	South Shields Con. Stk.	157—159	114—116	..
969,795	"	"	6	3⅛%	S'th Suburb'n Ord. 5 p.c.	114—116	73—76	..
60,000	"	"	5	5%	Do. 5 p.c. Pref.	110—113	75—78	..
135,000	—	—	—	3⅛%	Do. West Kent	..	..	..
187,658	Stk.	June 26	5	5%	Do. 5 p.c. Deb. Stk.	116—118	85—87	..
647,740	"	May 14	5	3%	Southampton Ord.	99—102	67—70	..
120,000	"	Feb. 12	7½	5⅛%	Tottenham District { A 5 p.c.	135—138	92—97	..
789,275	"	"	6	4%	B 3½ p.c.	115—117	67—69	..
181,255	"	June 26	4	4%	4 p.c. Deb.	87—89	62—64	..
189,380	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	..
236,476	Stk.	Mar. 12	5	5%	Tynemouth 5 p.c. max.	108½—109½	87—88	..
80,000	"	Feb. 26	8⅜	63/9	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	151—156	90—95	..
255,686	"	"	6⅞	48/9	Do. B 3½ p.c.	129—134	70—75	..
108,075	"	"	5/17/8	44/7½	Do. C 3½ p.c.	110—115	70—76	..
362,000	"	"	6½	42/6	Wimbledon 5 p.c.	117—122	70—75	72—72½
98,000	"	"	6⅔	48/9	Epsom 5 p.c.	121—126	72—77	..
88,416	"	June 26	3	3⅛%	3 p.c. Deb. Stk.	66—69	49—52	..

* *Ex div.*

Fatal Gas Leak Caused by Electricity.—Two persons have died, and a third is in a critical condition, at Swansea, through a gas escape under the floor of a landing, where the pipe ran alongside an electric cable. About 8 in. of the pipe had been melted away, thus permitting a large quantity of gas to escape. The victims were a woman aged 55, her mother, aged 80, and a servant. The two former were found dead in their beds; while the servant was on the floor of her room unconscious.

Wages at Bradford.—The Bradford War Wages Committee last week considered applications from the Bradford Corporation Employees' Joint Committee and the National Union of General Workers for an increase of 10s. on the present rate of war bonus. The Committee decided that, as from Dec. 1, the war wages payable to those who do not receive the 12½ p.ct. bonus shall be 30s. in the case of men and 21s. in the case of women, above pre-war rates—this involving an increase of 5s. for men and 3s. for women.

Communal Kitchen Pays its Way at Hastings.—The Bohemia communal kitchen at Hastings has completed a year's working; and after meeting all expenses (which include a weekly payment for wages, rent, and gas, at an average of about £2 10s.), there is a trifling balance in hand. In addition to this, however, the guarantors have been repaid 75 p.ct. of their money; and the remaining 25 p.ct. is covered by the value of the "stock-in-trade." The receipts during the second six months of the year were larger than in the first half.

Hull Corporation Gas Charge.—At the end of the current quarter, the Hull Corporation Gas Committee propose to increase the price of gas from 2s. 9d. to 3s. 6d. per 1000 c.ft. The Corporation purchase gas in bulk from the British Gas Light Company, and supply it to the Old Town. The loss during the war is estimated at £1500; and the increase is intended to liquidate the sum. The price in the other parts of the city is 3s. 2d. and 3s. 3d.; the gas being supplied by the British Gas Light Company and the East Hull Gas Company respectively.

Preference in Gas Supply at Kansas.—Mr. W. L. Lampkin, the Federal Fuel Administrator at Kansas City (Mo.), has declared that people who are using gas in their furnaces must discontinue the practice immediately, or forfeit their right to gas consumption for the rest of the winter. He says that the housewife is the first on the preferred list of gas consumers; and his office is going to see to it that there is no gas used for other purposes than cooking and lighting. There are a few industries in Kansas City that cannot change from gas to other fuel; but they will have to take their chance of getting gas.

British Dyes Amalgamation Scheme.—A correspondent of "The Times" says that important progress has been made with the scheme for the provision of a national dyestuff industry, and shareholders in British Dyes, Ltd., will presently be called on to ratify the arrangements made for amalgamation with Messrs. Levinstein, Ltd. A Committee was appointed in August to confer with the Directors regarding amalgamation, and to settle the details necessary to carry the operation into effect. Arrangements have been made which meet with the approval of the Board of Trade, the Directors of the respective Companies, and the representatives of the leading consumers of colour in this country. The scheme has, in fact, reached the point which should ideally have been attained three-and-a-half years ago; and, though much time has been irretrievably lost, the position now achieved affords considerable grounds for satisfaction.

Calorific Value to be Restored at Brighton.—The Brighton and Hove General Gas Company are arranging to restore the gas supplied by them to the full statutory standard at the earliest possible moment. They last week advised all the local authorities within the area as served by them that, as the Company have now been relieved by the Ministry of Munitions of the duty of supplying materials for the production of high explosives, it is their intention to restore the calorific value of the gas supplied to the full statutory standard of 500 B.Th.U. This will now be done as quickly as the quality and quantity of the coal now in stock will allow; and the full standard will be maintained in the future as far as the supply of raw materials renders it practicable to do so. The "Sussex Daily News" says the Engineer and General Manager of the Company (Mr. C. H. Rutter, M.Inst.C.E.) is to be congratulated upon this prompt arrangement to revert to pre-war conditions with the utmost dispatch.

Bournemouth Gas Company's Strike.—The account given in last week's "JOURNAL" under the above heading of the position of affairs at Poole was, we regret to find, hardly in accord with the facts. After being on strike for a few days and nights, the men returned to work on the advice of the Ministry of Munitions representative. Their return, however, was conditional, so far as the Company was concerned, upon their acceptance of the award of the Committee on Production, which award confirmed the rates of wages already being paid by the Company. It was also conditional upon the acceptance by the men of the agreement entered into between the Federated Trades Union and the National Gas Council, which is in force until February next. These terms the men accepted before their return to work; and there is no reason to suppose that they will do other than loyally abide by their pledged word. From this it will be seen that the various suggestions made in last week's account with regard to double time for Sundays and additional claims for 5s. as from Dec. 1 cannot arise, at any rate for the present.

The fusing of electric wires was stated to have been responsible last week for a fire (which, however, was extinguished before serious damage resulted) in a shop in High Street, Swansea.

The Ontario Fire Prevention League has been recently formed; and at a conference of those interested in the subject, a series of recommendations has been approved, one of which is that there should be an inspection of all electric wiring throughout the Province.

The Stanton Iron-Works Company, Ltd., have opened a branch office, under the management of Mr. G. W. Turner (for pig iron, cast-iron pipes, special castings, ironstone, and slag sales in the district) at Grosvenor Chambers, Deansgate, Manchester.

Owing to the failure of the electricity supply at Kingston-on-Thames last Tuesday night, the Liberal Coalition candidate began his electoral campaign in peculiar circumstances, the Baths Hall being unlighted. But with a hundred empty bottles fitted with candles, it was possible to light the hall sufficiently for the meeting to proceed.

The final one of the first series of lectures arranged by the Industrial Reconstruction Council will take place in the Saddlers' Hall, Cheapside, on Wednesday of next week. The chair will be taken by the Marquess of Salisbury, K.G.; and a lecture on "Science and Industry" will be delivered by Sir William S. M'Cormick, LL.D., of the Department of Industrial and Scientific Research.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

CHIEF ENGINEER. Metropolitan Water Board. Applications by Feb. 1.
MANAGER (Coke Oven and Bye Products Works). No. 6530.
INSPECTOR. No. 6541.
DRAUGHTSMAN (Coke Ovens). No. 6537.
DRAUGHTSMAN. No. 6535.
BRASSFINISHERS. No. 6534.
CHIEF MECHANICAL FITTER. Lancashire Corporation.
CARBONIZING FOREMAN. Barnet Gas and Water Company.
FOREMEN. No. 6533.
FOREMAN FITTER. Birmingham Gas Department.
LEADING FITTER. Cromer Gas Company.
FOREMAN. No. 6538.

Appointments, &c., Vacant.—*Continued.*

JUNIOR TECHNICAL ASSISTANT. No. 6540.
BUSINESS MOTOR DRIVER (Man or Woman). Mansfield & Co., Glengall Road, Peckham.
BLACKSMITH. South Kirkby, Featherstone, and Hemsworth Collieries.

Appointments, &c., Wanted.

ENTIRE MANAGEMENT OF MEDIUM SIZED GAS-WORKS. No. 6526.
ENGINEER AND MANAGER. No. 6532.
MANAGER. No. 6545.
RENTAL AND ESTIMATING WORK, &c. No. 6536.
MANAGER. No. 6545.
DISTRICT INSPECTOR. No. 6543.

Plant, &c., Wanted.

STATION METER. Guernsey Gas Light Company.

Plant, &c., for Sale.

COAL TRANSPORTERS. White Star Line, Liverpool.
IRON SHEETS. Erector, Leeds.
COPPER COUNTING MACHINE. No. 6539.

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CALCUTTA CORPORATION. Tenders by March 10.

Tar.
YEOVIL GAS DEPARTMENT. Tenders by Dec. 21.

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See Illustrated Advertisement, Nov. 19, p. 401.

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Applications (which need not be accompanied by Testimonials) must be on Forms to be obtained from the Clerk of the Board, 2, South Place, Finsbury Pavement, London, E.C. 2, and must be Delivered to him at that Address in sealed envelopes, endorsed "Chief Engineer," not later than 10 o'clock a.m. on the 1st of February, 1919.
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Finsbury Pavement,
London, E.C. 2,
Nov. 23, 1918.

DRAUGHTSMAN.

WANTED, Experienced Draughtsman with Knowledge of Regenerative Coke-Oven Construction, suitable for Steel Works. Permanency for Suitable Man.
Applications (which will be treated in confidence) to state fully Experience and Training, Age, and Salary required, to No. 6537, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

INSPECTOR required for a District of about 9000 Consumers in the Midlands. He would be required to Take Entire Charge of the Gas Fitters and must have received a Thorough Practical Training in the Modern Gas Fitting Work of a Gas Undertaking. He should be of Good Address, and fully competent to advise upon, and quote for, consumers' ordinary requirements.
Applications, which need not be accompanied by References in the first place, should be made, stating Training, Experience, Age, and Salary required, to No. 6541, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

DRAUGHTSMAN required, used to Colliery, Gas-Works, General Engineering, or Constructional Work, for Yorkshire District.
Apply, by letter, stating Experience and Salary required, to No. 6535, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

JUNIOR Technical Assistant is required for about 300 Millions Works in the Midlands with Carburetted Water Gas Plant, but no Residual Plants. He must be Capable of Carrying Out all the usual Tests, and would be required to Assist in the Management of the Works. Preference would be given to Applicants under Thirty Years of Age, trained on a similar or smaller sized works, and who has received Practical Training in the Shops.
Applications, which need not be accompanied by References in the first place, should be made, stating Training, Experience, Age, and Salary required, to No. 6540, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

R. & J. DEMPSTER, LTD., BEDFORD MANSION, BROADWAY, WESTMINSTER, S.W. 1. MANCHESTER. KENTISH TOWN, N.W. THE MITCHELL, FOR PATENT SLOT METER PAD & OTHER LOCKS.